

Appointment

From: Marbury, Candice [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=D7300EADDD1C42278AA4870C118374C6-MARBURY, CA]
Sent: 9/25/2018 2:01:14 PM
To: NMSS_Sec_Leave_Cal Resource [NMSS_Sec_Leave_Cal.Resource@nrc.gov]
Subject: FW: Part 192 Withdrawal
Location: HQ-TWFFN-05D30-19p
Start: 10/22/2018 5:00:00 PM
End: 10/22/2018 6:00:00 PM
Show Time As: Busy

EPA attendees will physically attend meeting at NRC Headquarters location (11555 Rockville Pike Rockville, MD 20852)

-----Original Appointment-----

From: NMSS_Sec_Leave_Cal Resource [mailto:NMSS_Sec_Leave_Cal.Resource@nrc.gov]
Sent: Tuesday, September 25, 2018 9:55 AM
To: NMSS_Sec_Leave_Cal Resource; Dapas, Marc; Tappert, John; Campbell, Tison; Silvia, Andrea; Pessin, Andrew; Holahan, Patricia; Marbury, Candice
Subject: Part 192 Withdrawal
When: Monday, October 22, 2018 1:00 PM-2:00 PM (UTC-05:00) Eastern Time (US & Canada).
Where: HQ-TWFFN-05D30-19p

EPA Attendees:

Jonathan Edwards, Director ORIA
 Mandy Gunasekara, OAR
 Lee Veal, Director RPD/ORIA
 Tom Peake, ORIA/RPD
 Dan Schultheisz, ORIA/RPD

Meeting requested by Candice Marbury, EPA Personal Phone / Ex. 6 Scheduled by Lisa Personal Phone / Ex. 6

Appointment

From: Fitzsimmons, Alexander [Alexander.Fitzsimmons@ee.doe.gov]
Sent: 7/27/2018 1:44:12 PM
To: Fitzsimmons, Alexander [Alexander.Fitzsimmons@ee.doe.gov]; Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Mandy and Alex call
Location: 202-287-5247

Start: 7/27/2018 8:45:00 PM
End: 7/27/2018 9:15:00 PM
Show Time As: Tentative

Recurrence: (none)

Message

From: David Beaudreau [dbeaudreau@dclrs.com]
Sent: 11/8/2018 5:40:29 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Dominguez, Alexander [dominguez.alexander@epa.gov]
Subject: Thank you
Attachments: ATT00001.txt

Mandy and Alex,

Thanks for taking a few minutes to speak with us yesterday. We appreciate any opportunity to interact/comment going forward.

Best,

David G. Beaudreau Jr.

Senior Vice President

D.C. Legislative and Regulatory Services, Inc.

2221 S. Clark Street, 11th Floor

Arlington, VA 22202

Main: 202-872-8440

Direct: 202-872-6884

www.dclrs.com



Message

From: Spencer, Peter [Peter.Spencer@mail.house.gov]
Sent: 11/27/2018 5:18:41 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Clifford, Brian (EPW) [Brian_Clifford@epw.senate.gov]
CC: Dominguez, Alexander [dominguez.alexander@epa.gov]
Subject: RE: COP

Thursday may be better for me.

From: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Sent: Tuesday, November 27, 2018 12:13 PM
To: Clifford, Brian (EPW) <Brian_Clifford@epw.senate.gov>; Spencer, Peter <Peter.Spencer@mail.house.gov>
Cc: Dominguez, Alexander <dominguez.alexander@epa.gov>
Subject: COP

Hey Brian and Peter,

I hope you both are well. I saw you are planning to attend the COP in Poland. Do you all have time this week for a quick call to discuss? Thursday morning – before noon - or Friday afternoon - 12:15 to 2 pm – are open on my end.

I look forward to catching up soon.

Best,
Mandy

Mandy M. Gunasekara
Principal Deputy Assistant Administrator
Office of Air and Radiation
US Environmental Protection Agency

Message

From: Michelle Bloodworth [mbloodworth@americaspower.org]
Sent: 11/27/2018 11:03:31 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
CC: Paul Bailey [pbailey@americaspower.org]
Subject: Speaker Request

Mandy,

I know this is short notice but would you be available to speak on the ACE Rule this Friday on a panel at ALEC. It's from 10:00 until 11:15 a.m. I'm on the panel along with Allison Wood of UARG. Clint was going to speak but is going to be out of town. You'd be perfect and we could really use someone from EPA.

Please let me know as soon as you can. I can give you the details if you are available.

Thanks,
Michelle

Michelle Bloodworth
President and CEO
4601 N. Fairfax Drive, Suite 1050 • Arlington, VA 22203
T: 202.459.4803 • M: 202.595.4663
mbloodworth@americaspower.org

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Message

From: King, Heidi (NHTSA) [heidi.king@dot.gov]
Sent: 11/16/2018 12:24:25 AM
To: Thiriez Stephane [stephane.thiriez@na.mitsubishi-motors.com]; Wehrum, Bill [Wehrum.Bill@epa.gov]
CC: Morrison, Jonathan (NHTSA) [Jonathan.Morrison@dot.gov]; Jim Tamm [james.tamm@dot.gov]; Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Charmley, William [charmley.william@epa.gov]; Atkinson, Emily [Atkinson.Emily@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]; Kuroda Manabu [manabu.kuroda@na.mitsubishi-motors.com]
Subject: Re: MEETING REQUEST - CAFE/GHG Emissions Compliance Projections

Thank you Stephane, I add Jonathan Morrison (Chief Counsel) and Belinda Rawls (my colleague who helps manage where I go)

Get Outlook for iOS

From: Thiriez Stephane <Stephane.Thiriez@na.mitsubishi-motors.com>
Sent: Thursday, November 15, 2018 7:19:23 PM
To: King, Heidi (NHTSA); Wehrum.Bill@epa.gov
Cc: Morrison, Jonathan (NHTSA); Tamm, James (NHTSA); Gunasekara.Mandy@epa.gov; charmley.william@epa.gov; atkinson.emily@epa.gov; Grundler.christopher@Epa.gov; Kuroda Manabu
Subject: MEETING REQUEST - CAFE/GHG Emissions Compliance Projections

Dear Ms. King, Mr. Wehrum,

We would like to request a meeting with you to share information about our CAFE/GHG emissions compliance projections, assumptions, and challenges.

As you may know, we had a meeting with the California Air Resources Board (CARB) last month to explain our CAFE/GHG emissions compliance projections through 2025 Model Year, along with the assumptions we made to develop those projections, and the challenges we face.

We feel it is important that we share with you the same information with shared with CARB. We hope this information will be helpful to you as you consider the appropriate level of the CAFE and GHG emissions standards.

We are available to meet with you Monday through Wednesday next week (Nov. 19-21), or the following week (Nov. 26-28). I expect a 1-hour meeting will be sufficient.

Please let me know if you are open to such a meeting, and -if so- what days and times work best for you.

Thank you in advance for your consideration,
 Stephane

Stephane Thiriez

Director, Regulatory Affairs

Mitsubishi Motors R&D of America, Inc.

2200 Clarendon Blvd., Suite 1401, Arlington, VA 22201

o: 734.477.6118 | m: 248.672.3249

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Message

From: CSIS Japan Chair [JapanChair@csis.org]
Sent: 11/8/2018 3:59:12 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: REMINDER: Business and Policy Views of Changing U.S.-Japan Relations

Friday, November 16, 12:00 - 4:15pm | Japan Chair

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The CSIS Japan Chair and Keidanren cordially invite you to

Business and Policy Views of Changing U.S.-Japan Relations

**Friday, November 16, 2018
12:00 pm - 4:15 pm**

2ND FLOOR CONFERENCE CENTER
CENTER FOR STRATEGIC & INTERNATIONAL STUDIES
1616 RHODE ISLAND AVE NW, WASHINGTON, D.C. 20036



For inquiries, please contact [Eri Hirano](#). Thank you.

12:00 Luncheon

12:20 Welcoming Remarks

John Hamre, President and CEO, CSIS
Hiromichi Iwasa, Chairman and CEO, Mitsui Fudosan

12:30 A Dialogue on U.S.-Japan Relations

Yasuo Fukuda, Former Prime Minister of Japan
Senator Thomas A. Daschle, Founder and CEO, The Daschle Group
John Hamre, President and CEO, CSIS

Moderator :

Michael J. Green, Senior Vice President for Asia and Japan Chair, CSIS ; Director of Asian Studies, Edmund A. Walsh School of Foreign Service, Georgetown University

13:30 Break

13:45 Panel One: U.S.-Japan Economic Relations

Wendy Cutler, Senior Vice President, Asia Society Policy Institute

Charles Freeman, Senior Vice President for Asia, U.S. Chamber of Commerce

Shigeru Hayakawa, Vice Chairman, Toyota Motor Corporation

Kazumasa Kusaka, Former Vice Minister, Ministry of Economy, Trade and Industry ;Chairman and CEO, Japan Economic Foundation

Moderator :

Matthew P. Goodman, Senior Vice President; William E. Simon Chair in Political Economy and Senior Adviser for Asian Economics, CSIS

15:00 Panel Two: Diplomacy and Security Cooperation

Masanori Nishi, Former Administrative Vice Minister of Defense

Sheila Smith, Senior Fellow for Japan Studies, Council for Foreign Relations

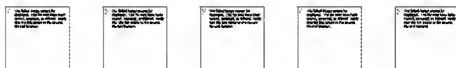
Moderator :

Michael J. Green, Senior Vice President for Asia and Japan Chair, CSIS ; Director of Asian Studies, Edmund A. Walsh School of Foreign Service, Georgetown University

16:15 Adjourn

Reception to Follow on 2nd Floor Terrace

This event is made possible by support from Keidanren.



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Message

From: Chartan, Steve (Cruz) [Steve_Chartan@cruz.senate.gov]
Sent: 11/28/2018 5:01:48 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]

Hey Mandy,

Hope you had a great Thanksgiving. Any chance you have a few minutes to chat about SREs? Cell

Personal Matters / Ex. 6

Personal Matters / Ex. 6

Message

From: Lewie Pugh [Lewie_Pugh@ooida.com]
Sent: 11/15/2018 11:49:31 PM
To: Bennett, Tate [Bennett.Tate@epa.gov]; Nile Elam [Nile_Elam@ooida.com]
CC: Mike Matousek [Mike_Matousek@ooida.com]; Collin Long [Collin_Long@ooida.com]; Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: RE: Thank you!

Tate,
 I was nice to meet you.

As I stated before it was my pleasure. I am glad to be there anytime to both represent small business truckers but to also assist in any way with fair and balanced legislation.

Lewie

From: Bennett, Tate <Bennett.Tate@epa.gov>
Sent: Thursday, November 15, 2018 4:02 PM
To: Nile Elam <Nile_Elam@ooida.com>
Cc: Mike Matousek <Mike_Matousek@ooida.com>; Collin Long <Collin_Long@ooida.com>; Lewie Pugh <Lewie_Pugh@ooida.com>; Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Subject: RE: Thank you!

You bet! Thanks, Lewie, for taking part during a very busy week on your end. Please do keep in touch with Mandy on this and thanks for your participation.

From: Nile Elam [mailto:Nile_Elam@ooida.com]
Sent: Thursday, November 15, 2018 2:31 PM
To: Bennett, Tate <Bennett.Tate@epa.gov>
Cc: Mike Matousek <Mike_Matousek@ooida.com>; Collin Long <Collin_Long@ooida.com>; Lewie Pugh <Lewie_Pugh@ooida.com>
Subject: Thank you!

Hey Tate,

I know I have said it a few times, but thank you again for all your help inviting OOIDA and coordinating with us over the past couple of weeks! I hope Lewie's comments on behalf of OOIDA at the roundtable and media announcement were worthwhile, and thank you for getting us in touch with the agency's media team regarding the Administrator's participation on our Land Line Now radio show.

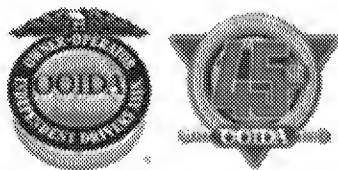
Please keep us in the loop as conversations regarding NOx standards begin and we are eager to share our insights and concerns at future meetings, roundtables, etc. I will also stay on Mandy's radar in case other trucking-related issues, not limited to NOx, come up and offer our perspective.

Enjoy the rest of the week and please let me know if you need anything else from us!

My Best,

Nile Elam | Director of Legislative Affairs
 Owner-Operator Independent Drivers Association

nile_elam@ooida.com | (202) 347-2007
T: 800-444-5791



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Message

From: Gary Jones [gjones@sgia.org]
Sent: 11/20/2018 9:51:33 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
CC: marcik@sgia.org
Subject: RE: once-in/always-in references

Mandy:

I wanted to follow up with you regarding the email I sent last week.

Were you interested in having a meeting to discuss how the concept for major sources of HAPs can be expanded to include VOC sources as well?

I may be back in the DC area in December if you had some where we could get together. Barnes Johnson wanted to have a meeting with me to discuss the solvent recovery issue and I would like to coordinate the dates if you wanted to get together.

Please let me know.

Gary Jones
 Director, Environmental, Health, and Safety Affairs
 Specialty Graphic Imaging Association
 10015 Main St., Fairfax, VA 22031
 703.359.1363 | gjones@sgia.org

-----Original Message-----

From: Gary Jones
Sent: Monday, November 12, 2018 4:49 PM
To: 'gunasekara.mandy@epa.gov' <gunasekara.mandy@epa.gov>
Cc: Marcia Kinter <marcik@sgia.org>
Subject: FW: once-in/always-in references

Mandy:

It was great to meet you last week at the Small Business Meeting.

One of the items we discussed is the "Once-In/Always-In" policy and pending rulemaking. We would like to see the policy and pending rulemaking also include VOC emissions sources as well as HAP sources.

As promised, I have attached the info I received on the topic from EPA many years ago. These are the initial references to the application of the concept to VOC sources.

Please let me know if you have any questions or would like to set up a meeting to discuss.

Gary Jones
 Director, Environmental, Health, and Safety Affairs Specialty Graphic Imaging Association
 10015 Main St., Fairfax, VA 22031
 703.359.1363 | gjones@sgia.org

-----Original Message-----

From: Johnson.WilliamL@epamail.epa.gov <Johnson.WilliamL@epamail.epa.gov>
Sent: Friday, June 12, 2009 12:24 PM
To: Jones, Gary <gjones@printing.org>
Cc: Salman.Dave@epamail.epa.gov
Subject: once-in/always-in references

Gary Jones,

The 1988 "Blue Book" (Issues Relating to VOC Regulation Cutpoints, Deficiencies, and Deviations" is the earliest reference I have been able to find regarding "once in-always in". It is mentioned in the executive summary under Definition of 100 tpy non-CTG source. It is also mentioned on page 2-3. The blue book may be found at this web site:

http://www.epa.gov/ttn/naaqs/ozone/ozonetech/voc_bluebook.pdf

I also found a 1990 memo ("Once-in/Always-in" Requirement for Applicability) which discusses once in -always in and references the blue book. Here is a copy of that memo.

(See attached file: once in, always in memo.doc)

William L. Johnson

State and Local Programs Group (C539-01) Office of Air Quality Planning and Standards U. S. Environmental Protection Agency Research Triangle Park, NC 27711

919-541-5245 (v); 919-541-0824 (fax)

johnson.williamL@epa.gov

Printing United<<http://printingunited.com/>>: Dallas, TX | October 23-25, 2019

Digital Textile Printing Conference<<https://www.aatcc.org/evnt/conferences/printing/>>: Durham, NC | December 5-6, 2018

THREADX<<http://threadxconference.com/>>: San Diego CA | February 17-19, 2019

SPIRE<<https://sgia.swoogo.com/SPIRE2019>>: San Diego, CA | February 24-26, 2019

Contact Becca Moss<<http://becca@sgia.org>> to renew your membership before December 31st, 2018

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Facebook<<https://www.facebook.com/SGIAORG>>

Message

From: Amy Harder [amy@axios.com]
Sent: 11/26/2018 10:44:20 AM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Bill Gates' new crusade: Sounding the climate-change alarm

[View this email in your browser](#)

The image shows the Axios logo, which consists of the word "AXIOS" in a bold, white, sans-serif font. The letter "A" is stylized with a grey, textured, triangular shape on its left side. The logo is centered on a solid black rectangular background.

Good morning all,

Did you catch Axios on HBO last night? We interviewed Bill Gates on climate change, which is the topic of my latest column. It's linked here and copied below: <http://axios.link/00m3>

Stay tuned for a bonus Axios on HBO segment in the coming days.

Lastly, I also have [another story up](#) today on a new industry report finding consumer costs are limited if the Trump administration enforces the Obama-era Kigali amendment to the Montreal Protocol.

Cheers,

Amy

COLUMN / HARDER LINE

Bill Gates' new crusade: Sounding the climate-change alarm

Meet Bill Gates. You know him most as co-founder of Microsoft and one of the richest people on the planet.

Why he matters: I know him as an advocate for climate change and clean energy. Gates has long worked on these issues, but here's what's new for the tech visionary: he's increasingly worried not enough people understand the dimensions of the problem and that it's going to prevent progress. This escalation was on display in a 40-minute interview with "Axios on HBO."

The intrigue: Talking recently at his private offices overlooking the water in Kirkland, Washington, near Seattle, Gates went wonky more than he went visionary. He didn't criticize President Trump's positions dismissing climate change, even though he's spent a significant amount of energy trying to change his mind.

- Instead, Gates is sounding the alarm about discord over how to solve the problem. He said people who are laser-focused on solving climate change with renewable energy — chiefly wind and solar — only are just as bad as those blocking action (i.e., Trump).

Some grassroots environmental groups, led by 350.org, have found support for a renewables-only strategy in Rep.-elect Alexandria Ocasio-Cortez (D.-N.Y.), a rising progressive star who is pushing for such a policy with Democrats now controlling the House.

"That general impression that 'Oh, it's just about solar and wind,' that I think is as dangerous to us as the fact that in one country, the U.S., there's a faction that associates with 'Hey, let's not make any trade-offs to go in and solve this problem.'"

Bill Gates

Gates and his team devised a pie chart — which he brought up repeatedly throughout the interview — showing the causes of the world's greenhouse gas emissions. Wind and solar are used for electricity, which makes up a quarter of the world's emissions.

Other pieces:

- Transportation: 14%
- Manufacturing: 21%

- Buildings: 6%
- Agriculture: 24%
- Other sources: 10%

Gates is imploring people to realize that addressing climate change means changing the fundamental way our lives are run, which ultimately means the entire global economy.

"You know for example if synthetic meat works that actually is a pretty big deal. But that's at an early stage. If electric cars become mainstream products, which they are not today, that's also a little piece of the problem. But you need to make steel in new ways, you need to make fertilizer in new ways."

Bill Gates

Gates has a long history investing in clean-energy technologies, and he's ramping up this work in recent months.

- He is leading a coalition of billionaires, including Jeff Bezos and George Soros, investing in a range of technologies, including batteries and new ways to get water.
- In October, that group inked a similar investment fund with the European Commission.
- Also in October, Gates announced a new initiative on adapting to climate change, which is a big focus of the Bill & Melinda Gates Foundation.

Gates also has investments in TerraPower, which is seeking to build an advanced nuclear reactor, and a company called Carbon Engineering, which makes a technology that captures carbon dioxide emissions straight from the sky.

Critics don't like that idea. They say investing in technologies like that could lessen the urgency of cutting emissions — because it creates a way to take them out of the atmosphere later.

But Gates flatly rejected that criticism: “Maybe to encourage people to stop eating too much we should stop doing heart surgery, because it's really letting people develop heart problems.”

Gates said he was optimistic that humanity can tackle climate change, but he didn't exactly show it. Toward the end of our interview, which went double the scheduled time, he observed how some issues gain traction while others don't.

“On some issues, like should women be treated better, whatever isn't being done in the administration, the counter reaction is strong enough that I feel good that movement is stronger today, and I think it'll get stronger in the future.”

He then concluded:

“On climate change, it's hard because we'll get interested and then let's say the U.S. economy isn't as strong. You know, people's willingness to talk about something that's 40 years away is a lot higher when a lot of things are going well.”

We can at least count on Gates, whose net worth is just shy of \$100 billion, to care about this issue even if the economy tanks for the rest of us.

Amy
energy reporter, Axios

202.906.9629

@AmyAHarder



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Message

From: Richard Westerdale [richard.westerdale@jet-inc.com]
Sent: 11/16/2018 6:34:42 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
CC: Dominguez, Alexander [dominguez.alexander@epa.gov]
Subject: Re: Coal Industry Opportunity

Mandy -

Sorry to pester you but we are finalizing travel plans and I want to check if the meeting will be on Tuesday afternoon or Wednesday morning?

Thanks,

Rick

Sent from my iPhone

On Nov 14, 2018, at 12:50 PM, Gunasekara, Mandy <Gunasekara.Mandy@epa.gov> wrote:

Hi Rick,
Bills scheduler, Delaney, will be following up.

Sent from my iPhone

On Nov 14, 2018, at 12:48 PM, Richard Westerdale <richard.westerdale@jet-inc.com> wrote:

Mandy –

I am getting ready to hop on a plane from Abu Dhabi back to NYC but wanted to check to see if you were able to confirm a meeting for next week on 11/20? I appreciate your assistance in this regard. All the best.

Thanks,

Richard (Rick) W. Westerdale II
Senior Vice President
Tel: +1 (201) 641-3868, ext. 222
Email: richard.westerdale@jet-inc.com
Website: www.jet-inc.com
Address: 65 Challenger Rd, Suite 420 Ridgefield Park, NJ, 07660, USA
<image001.png>

What you choose to give life today will determine what life will give you tomorrow.

From: Richard Westerdale
Sent: Friday, November 9, 2018 6:58 PM
To: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>

Cc: Dominguez, Alexander <dominguez.alexander@epa.gov>

Subject: Re: Coal Industry Opportunity

Mandy -

Wanted to follow up with you. I didn't hear back from Hayly today. Please advise if you were able to schedule the meeting.

Thanks,

Rick

Sent from my iPhone

On Nov 8, 2018, at 1:26 PM, Gunasekara, Mandy <Gunasekara.Mandy@epa.gov> wrote:

Hi Richard,
Great catching up. I just got off the phone with Hayly Humphreys who is the Administrator's scheduler. She is going to see if they can fit in a meeting on the 20th. They have a scheduling meeting tomorrow where they will discuss the request and follow-up soon thereafter. If you don't hear from anyone by COB tomorrow, feel free to shoot me a note.
Best,
Mandy

From: Richard Westerdale [<mailto:richard.westerdale@jet-inc.com>]

Sent: Tuesday, November 6, 2018 3:22 PM

To: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>

Subject: RE: Coal Industry Opportunity

Mandy –

Would it be possible to meet with Acting Administrator Wheeler and his staff? I realize that the original request inadvertently requested his predecessor. I would appreciate any guidance or feedback in this regard. We have confirmed a meeting with the White House and National Security Council on 11/20 @ 11 AM.

In advance, I appreciate your assistance.

Thanks,

Richard (Rick) W. Westerdale II

Senior Vice President

Tel: +1 (201) 641-3868, ext. 222

Email: richard.westerdale@jet-inc.com

Website: www.jet-inc.com

Address: 65 Challenger Rd, Suite 420 Ridgefield Park, NJ, 07660, USA

<image001.png>

What you choose to give life today will determine what life will give you tomorrow.

From: Richard Westerdale
Sent: Monday, November 5, 2018 1:58 PM
To: 'gunasekara.mandy@epa.gov' <gunasekara.mandy@epa.gov>
Cc: 'shelby.michael@epa.gov' <shelby.michael@epa.gov>
Subject: RE: Coal Industry Opportunity

Mandy –

I know that you have been quite busy. I wanted to let you know that we have confirmed meetings with the White House and National Security Council on 11/20 @ 11 AM. Thus, I want to check to see if Administrator Pruitt and staff would be available on the afternoon of 11/20 or during the day of 11/21? I appreciate your diligence in this regard.

Thanks,

Richard (Rick) W. Westerdale II
Senior Vice President
Tel: +1 (201) 641-3868, ext. 222
Email: richard.westerdale@jet-inc.com
Website: www.jet-inc.com
Address: 65 Challenger Rd, Suite 420 Ridgefield Park, NJ, 07660, USA
<image001.png>

What you choose to give life today will determine what life will give you tomorrow.

From: Richard Westerdale
Sent: Thursday, November 1, 2018 3:50 PM
To: 'gunasekara.mandy@epa.gov' <gunasekara.mandy@epa.gov>
Cc: 'shelby.michael@epa.gov' <shelby.michael@epa.gov>
Subject: Coal Industry Opportunity

Mandy / Michael –

I want to follow up with you to see about possible meeting dates for Acting Administrator Wheeler and staff? I have two windows of opportunity and wanted to check schedules – Thurs / Fri (11/8-11/9) or Mon/Tues (11/19-11/20). We are also scheduling meetings with Secretary Perry, the NSC as well as the Whitehouse during this time, so as you can imagine, it is quite challenging to get the planets to align.

This is a proven technology with over 300 current applications internationally. We are currently targeting more than 40 coal fired power plants (negotiations on-going) in the U.S. for

implementation. Through implementation of our technology, the useful life of these power plants will be extended by 10 to 15 years while meeting the new emission standards. This is a game changer!

JET's U.S. Value Proposition:

- Total investment: \$16B
- Annual Revenues: \$22B
- Annual Taxes: \$883M
- Direct Jobs: 14,250

Our Chairman will be visiting Washington to brief senior officials on the benefits to the U.S. We would also like to discuss the technology, necessary project approvals and the President's executive order to streamline reviews for infrastructure projects. Please let me know if there is availability during these dates or if there is someone else that I should be in touch with, please point me in that direction.

Thanks,

Richard (Rick) W. Westerdale II

Senior Vice President

Tel: +1 (201) 641-3868, ext. 222

Email: richard.westerdale@jet-inc.com

Website: www.jet-inc.com

Address: 65 Challenger Rd, Suite 420 Ridgefield Park, NJ, 07660, USA

<image001.png>

What you choose to give life today will determine what life will give you tomorrow.

From: Richard Westerdale

Sent: Tuesday, October 30, 2018 12:59 PM

To: 'gunasekara.mandy@epa.gov' <gunasekara.mandy@epa.gov>

Cc: 'SimpsonMM@state.gov' <SimpsonMM@state.gov>

Subject: Introduction

Mandy –

I trust you are well. Melissa Simpson suggested that I reach out to you. I recently left the U.S. Department of State to join JNG.

JNG is an international corporation and leading provider of advanced desulfurization technology for the power, oil and natural gas sectors. Specifically, our patented technology is a game changer and converts harmful emissions, specifically Sulphur dioxide, into a value added fertilizer (see attached brochure). This is a proven technology with over 300 current applications internationally. We are currently targeting more than 40 coal fired power plants in the U.S. for implementation. The initial assessment is that through implementation

of our technology, the useful life of these power plants will be extended by 10 to 15 years while meeting the new emission standards.

Our Chairman would like to come to Washington and brief the Administrator and his staff on the potential benefits to the U.S. We would also like to discuss the necessary project approvals and the President's executive order to streamline reviews for infrastructure projects. Thus, I would like to propose a meeting on Thursday, November 9th. For awareness, we are also scheduling meetings with Sec. Perry's office as well as the NSC.

I look forward to your response and meeting in person.

Thanks,

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give you tomorrow.

Message

From: Richard Westerdale [richard.westerdale@jet-inc.com]
Sent: 11/9/2018 11:57:49 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
CC: Dominguez, Alexander [dominguez.alexander@epa.gov]
Subject: Re: Coal Industry Opportunity

Mandy -

Wanted to follow up with you. I didn't hear back from Hayly today. Please advise if you were able to schedule the meeting.

Thanks,

Rick

Sent from my iPhone

On Nov 8, 2018, at 1:26 PM, Gunasekara, Mandy <Gunasekara.Mandy@epa.gov> wrote:

Hi Richard,
 Great catching up. I just got off the phone with Hayly Humphreys who is the Administrator's scheduler. She is going to see if they can fit in a meeting on the 20th. They have a scheduling meeting tomorrow where they will discuss the request and follow-up soon thereafter. If you don't hear from anyone by COB tomorrow, feel free to shoot me a note.
 Best,
 Mandy

From: Richard Westerdale [<mailto:richard.westerdale@jet-inc.com>]
Sent: Tuesday, November 6, 2018 3:22 PM
To: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Subject: RE: Coal Industry Opportunity

Mandy -

Would it be possible to meet with Acting Administrator Wheeler and his staff? I realize that the original request inadvertently requested his predecessor. I would appreciate any guidance or feedback in this regard. We have a confirmed a meeting with the White House and National Security Council on 11/20 @ 11 AM.

In advance, I appreciate your assistance.

Thanks,

Richard (Rick) W. Westerdale II
Senior Vice President
 Tel: +1 (201) 641-3868, ext. 222
 Email: richard.westerdale@jet-inc.com
 Website: www.jet-inc.com
 Address: 65 Challenger Rd, Suite 420 Ridgefield Park, NJ, 07660, USA
 <image001.png>

What you choose to give life today will determine what life will give you tomorrow.

From: Richard Westerdale

Sent: Monday, November 5, 2018 1:58 PM

To: 'gunasekara.mandy@epa.gov' <gunasekara.mandy@epa.gov>

Cc: 'shelby.michael@epa.gov' <shelby.michael@epa.gov>

Subject: RE: Coal Industry Opportunity

Mandy –

I know that you have been quite busy. I wanted to let you know that we have confirmed meetings with the White House and National Security Council on 11/20 @ 11 AM. Thus, I want to check to see if Administrator Pruitt and staff would be available on the afternoon of 11/20 or during the day of 11/21? I appreciate your diligence in this regard.

Thanks,

Richard (Rick) W. Westerdale II

Senior Vice President

Tel: +1 (201) 641-3868, ext. 222

Email: richard.westerdale@jet-inc.com

Website: www.jet-inc.com

Address: 65 Challenger Rd, Suite 420 Ridgefield Park, NJ, 07660, USA

<image001.png>

What you choose to give life today will determine what life will give you tomorrow.

From: Richard Westerdale

Sent: Thursday, November 1, 2018 3:50 PM

To: 'gunasekara.mandy@epa.gov' <gunasekara.mandy@epa.gov>

Cc: 'shelby.michael@epa.gov' <shelby.michael@epa.gov>

Subject: Coal Industry Opportunity

Mandy / Michael –

I want to follow up with you to see about possible meeting dates for Administrator Pruitt and staff? I have two windows of opportunity and wanted to check schedules – Thurs / Fri (11/8-11/9) or Mon/Tues (11/19-11/20). We are also scheduling meetings with Secretary Perry, the NSC as well as the Whitehouse during this time, so as you can imagine, it is quite challenging to get the planets to align.

This is a proven technology with over 300 current applications internationally. We are currently targeting more than 40 coal fired power plants (negotiations on-going) in the U.S. for implementation. Through implementation of our technology, the useful life of these power plants will be extended by 10 to 15 years while meeting the new emission standards. This is a game changer!

JET's U.S. Value Proposition:

- Total investment: \$16B
- Annual Revenues: \$22B
- Annual Taxes: \$883M

- Direct Jobs: 14,250

Our Chairman will be visiting Washington to brief senior officials on the benefits to the U.S. We would also like to discuss the technology, necessary project approvals and the President's executive order to streamline reviews for infrastructure projects. Please let me know if there is availability during these dates or if there is someone else that I should be in touch with, please point me in that direction.

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Richard (Rick) W. Westerdale II

Senior Vice President

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Website: www.jet-inc.com

Address: 65 Challenger Rd, Suite 420 Ridgefield Park, NJ, 07660, USA

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Cc: 'SimpsonMM@state.gov' <SimpsonMM@state.gov>

Subject: Introduction

Mandy –

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I look forward to your response and meeting in person.

Thanks,

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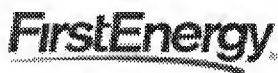
Message

From: Eckard, J. M [jeckard@firstenergycorp.com]
Sent: 2/28/2019 7:33:04 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Thanks & see you Monday

We're on for Monday at 6:00 at the Capital Grille. Joining Anthony and me will be George Farah, Vice President and Dave Frederick, Director from our Environmental Group. Each has great expertise and deep experience with environmental regulations, compliance and knows a lot of people in the "regulated community". I'm optimistic it will prove to be a fruitful discussion. Thanks.

Mike

J. Michael Eckard
Vice President, Federal Government Affairs
FirstEnergy
801 Pennsylvania Ave., Suite 310
Washington, D.C. 20004
202.434-8153
202.434-8156 (fax)
202.309.3402 (cell)
jeckard@firstenergycorp.com



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Message

From: The Team at CQ [updates@cq.com]
Sent: 2/6/2019 7:34:42 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: CQ Policy Briefing on Budget



CQ Policy Briefings:
FEDERAL BUDGET
A CQ Event

RESERVE YOUR SPOT

A morning discussing the President's budget and funding proposals.

Hello,

CQ's next policy briefing features the latest insights on President Trump's budget and funding proposals.

We'd love for you to join us.

As a part of the FiscalNote family, our event will take place at FiscalNote's headquarters.

RESERVE YOUR SPOT

When: February 12, 8:00am – 9:00am

Where: FiscalNote's headquarters @ 1201 Penn Ave

Cost: Free, breakfast included

Other Details: *When you arrive, please check in with the front desk before proceeding to the conference room in the downstairs lobby.*

This month's speakers

Peter Cohn is a budget and fiscal policy editor at CQ Roll Call. Pete began at CQ in 2000 as a transportation reporter before covering the federal budget, appropriations, tax and trade policy at National Journal. Pete returned to CQ in September after several years in the securities industry tracking and forecasting fiscal policy decisions and a stint consulting for corporate and nonprofit clients.

Paul M. Krawzak is a senior budget reporter for CQ Roll Call, where he has worked since 2008. He has broken numerous political stories, including one about the Congressional Budget's Office inability to estimate the cost of the Affordable Care Act. Prior to that, he wrote for the San Diego Union Tribune, the Copley News Service in both D.C. and Chicago, and newspapers in Illinois and Michigan.

What are CQ Policy Briefings?

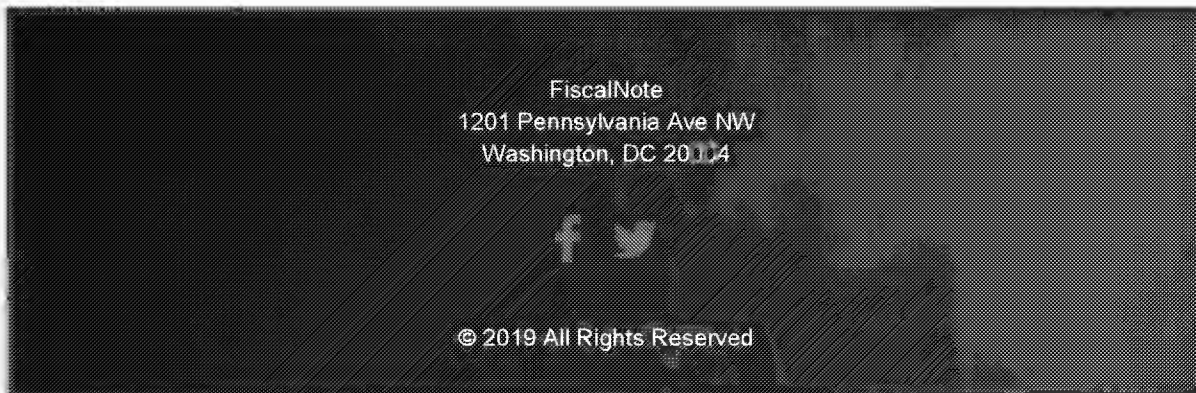
CQ Policy Briefings are monthly, live events where our expert journalists dive into the most important news, legislation, and policy. Attendees get their questions answered in great detail from policy veterans with years of experience.

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This email was sent to gunasekara.mandy@epa.gov. You may change your email subscription settings at any time by clicking [here](#).

Message

From: Braniff, Mimi P [mimi.braniff@delta.com]
Sent: 11/14/2018 8:11:32 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Dominguez, Alexander [dominguez.alexander@epa.gov]
Subject: Monroe RFS Petition for Waiver of Volumes due to Severe Economic Harm
Attachments: ATT00001.txt; Monroe - Waiver Petition - 11-13-18.pdf

FYI- attached is our Petition filed last night. Mimi

Mimi Braniff |  | Managing Director—Government Affairs
P: 202.243.3580 | 1212 New York Ave NW Ste 200 Washington, DC 20005

From: Braniff, Mimi P
Sent: Friday, November 09, 2018 3:50 PM
To: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>; Dominguez, Alexander <dominguez.alexander@epa.gov>
Subject: PA Gov. RFS Petition for Waiver of Volumes due to Severe Economic Harm

Hi Mandy and Alex- Happy Friday. In case this has not reached your desk yet, attached is Gov. Wolf's waiver petition. He cites to our Dr. Pirrong study, which I have also attached. We are going to filing a Petition as well, so we have standing to sue on this issue should the waiver petition be denied. We met with EPA's general counsel to talk about how EPA is incorrectly evaluating the standard for "severe economic harm". Can we find some time for a phone call next week to discuss? Please let me know your availability.

Thanks! Mimi

Mimi Braniff |  | Managing Director—Government Affairs
P: 202.243.3580 | 1212 New York Ave NW Ste 200 Washington, DC 20005

Message


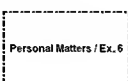
From: Brian Diffell [diffell@wtppgroup.com]
Sent: 11/6/2018 8:03:25 PM
To: Dominguez, Alexander [dominguez.alexander@epa.gov]
CC: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Re: Reconnecting

Hi Alex. We are on the call

Sent from my iPhone

On Nov 6, 2018, at 12:01 PM, Dominguez, Alexander <dominguez.alexander@epa.gov> wrote:

Hey Brian - Confirmed for today at 3:00

Conference Line:  + ID: 

Sent from my iPhone

From: Brian Diffell [<mailto:diffell@wtppgroup.com>]
Sent: Monday, November 5, 2018 8:49 PM
To: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Cc: Dominguez, Alexander <dominguez.alexander@epa.gov>
Subject: Re: Reconnecting

Thanks Mandy. How about 3?

Sent from my iPhone

On Nov 5, 2018, at 5:26 PM, Gunasekara, Mandy <Gunasekara.Mandy@epa.gov> wrote:

Hey Brian,
Great to hear from you and I hope all is well. Are you free tomorrow afternoon for a call? I'm flexible after 1 pm. Let me know what will work.
Best,
Mandy

Sent from my iPhone

On Nov 5, 2018, at 4:17 PM, Brian Diffell <diffell@wtppgroup.com> wrote:

Hi Mandy, I hope you are doing well. You may remember working with me on issues related to steel plant emissions with Leggett & Platt last year. I really appreciated all your efforts.

I'm not actually sure you're still at EPA, but if you are, I had a quick question I was wondering if we could connect about. Thanks so much!

Brian C. Diffell
WTG Global
Desk: (202) 534-4959
Cell: (202) 557-5983

diffell@wtppgroup.com

Message

From: Schatte, Conrad [cschatt@entergy.com]
Sent: 11/16/2018 3:47:32 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Entergy and Arkansas Regional Haze Agreement

Hey Many - I am reaching out to you regarding the pending announcement of a finalized agreement regarding the Arkansas Regional Haze plan. To meet U.S. Environmental Protection Agency requirements for regional haze, Entergy would have had to either add costly upgrades to the plants or cease using coal at White Bluff and Independence by 2021. Entergy's obligation would have required nearly \$2 billion of technology improvements by 2021 to Entergy's White Bluff and Independence plants, four coal-fired units which have been in service for around 35 years. If the improvements were not made by 2021, Entergy was required under the federal program to cease coal-fired operations at the plants.

Entergy did not believe the federal requirement to install costly emission controls by 2021 at this stage of the plants' life cycles made sense for customers or was required by the Clean Air Act. In addition, there was insufficient time to effectively and efficiently replace the generating resources by 2021. These requirements were temporarily stayed by federal courts, which allowed time for successful negotiation of the agreement.

With the new agreement in place, Entergy Arkansas will:

- o Begin using only low sulfur coal at the White Bluff and Independence coal plants starting no later than June 30, 2021.
- o Cease to use coal (cease operations) White Bluff no later than the end of 2028. (At year-end 2028 White Bluff will be 48 years old.)
- o Cease to use coal (cease operations) Independence no later than the end of 2030. (At year-end 2030 Independence will be 47 years old.)
- o Cease operations at Lake Catherine Unit 4 by the end of 2027. At year-end 2027 Lake Catherine will be 57 years old.
- o Reserve the option to develop new generating sources at each plant site.
- o Along with the co-owners of these plants, develop or make recommendations to applicable regulators for the development of 800 megawatts of renewable generation, with 400 megawatts recommended by the end of 2022 and the remainder developed or recommended no later than the end of 2027.

The economic analyses demonstrate that ceasing to use coal at White Bluff in 2028 and at Independence in 2030 is in the best economic interest of customers. This plan enables the company to realize the bulk of the economic lives of the units and significantly reduces any costs that must be recovered from customers in rates after the identified generators are no longer in service. Also of importance, the agreement enables us to continue job and career planning opportunities to our employees for employees at the plants beyond 2021.

Let me know if you have any questions – many thanks,
 Conrad

Conrad Schatte
 Entergy Federal Government Affairs
cschatt@entergy.com
 202-530-7308 (direct)
 202-549-6725 (mobile)

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Message

From: Szabo, Aaron L. EOP/CEQ **EOP / Ex. 6**
Sent: 11/19/2018 7:21:48 PM
To: Schwab, Justin [Schwab.Justin@epa.gov]; Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: CEQ Sustainability Implementing Instructions
Attachments: EO 13834 Instructions DRAFT.docx

FYI. Please check out the SNAP.

Aaron L. Szabo
Senior Counsel
Council on Environmental Quality

EOP / Ex. 6 (Desk)
(Cell)
Aaron.L.Szabo@ceq.eop.gov

Message

From: Lee Fuller [lfuller@ipaa.org]
Sent: 11/7/2018 5:01:10 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
CC: Dominguez, Alexander [dominguez.alexander@epa.gov]
Subject: RE: Subpart OOOOa Proposal

Thanks, Mandy,

I'll work out details with him.

Lee

From: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Sent: Wednesday, November 7, 2018 8:17 AM
To: Lee Fuller <lfuller@ipaa.org>
Cc: Dominguez, Alexander <dominguez.alexander@epa.gov>
Subject: Re: Subpart OOOOa Proposal

Hey Lee,
I'm happy to meet- looping in Alex to help with the logistics.
Talk soon,
Mandy

Sent from my iPhone

On Nov 6, 2018, at 5:41 PM, Lee Fuller <lfuller@ipaa.org> wrote:

Mandy,

I had hoped to catch you at the Small Business meeting but I saw you had to leave. I want to arrange a meeting sometime in December before the comment deadline of December 17 to discuss our assessment and concerns with the new Subpart OOOOa proposal. Please let me know if there are some convenient times for a meeting.

Thanks,

Lee Fuller

Message

From: Miller, Bruce [Bruce.Miller@mail.house.gov]
Sent: 11/26/2018 2:35:21 PM
To: Dominguez, Alexander [dominguez.alexander@epa.gov]
CC: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: RE: renewable identification numbers (RINs)

Thanks, you can call me at Personal Phone / Ex. 6 Talk to ya Friday.

From: Dominguez, Alexander [mailto:dominguez.alexander@epa.gov]
Sent: Friday, November 23, 2018 10:34 AM
To: Miller, Bruce
Cc: Gunasekara, Mandy
Subject: RE: renewable identification numbers (RINs)

We are confirmed for Friday, November 30th at 3:00pm. If you could let me know the best number to reach you at we will be all set.

From: Miller, Bruce <Bruce.Miller@mail.house.gov>
Sent: Tuesday, November 20, 2018 3:58 PM
To: Dominguez, Alexander <dominguez.alexander@epa.gov>
Cc: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Subject: Re: renewable identification numbers (RINs)

Hey guys - thanks so much. Can we shoot for 3 on next Friday?

On Nov 19, 2018, at 1:08 PM, Dominguez, Alexander <dominguez.alexander@epa.gov> wrote:

Hey Bruce,

Apologies for the delay and wondering if you have availability next Friday (11/30) for a call with me and Mandy to discuss further? If so, 1:15 – 2:00 or 3:00 - cob are wide open. Just let me know and I'll lock it down.

Best,

Alex Dominguez
 Policy Advisor to the Assistant Administrator
 Office of Air and Radiation
 U.S. Environmental Protection Agency
 D: 202-564-3164
 M: 202-578-5985

From: Miller, Bruce <Bruce.Miller@mail.house.gov>
Sent: Friday, November 9, 2018 9:25 AM
To: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Cc: Dominguez, Alexander <dominguez.alexander@epa.gov>
Subject: RE: renewable identification numbers (RINs)

Hey Alex – Sorry, this has taken folks a while to digest. But wanted to follow-up in an informal capacity again on this issue. I had a few questions that if you have a minute address, it would be appreciated! Thanks so much!

Notwithstanding issues related to bandwidth/capacity at the staff level, could the biointermediate issues be successfully incorporated into one of the pending proposed rules in the unified regulatory agenda on renewable fuels? One option might be the proposed rule labeled “2060-AU28” which notes it will include “regulatory amendments designed to provide clarity and increase opportunities for renewable fuel production.”

If 2060-AU28 is not an option, are any of the other proposed rules in the unified regulatory agenda an option for including biointermediates?

Does EPA need specific direction and/or guidance from Congress to prioritize action on biointermediates in 2019?

From: Gunasekara, Mandy [<mailto:Gunasekara.Mandy@epa.gov>]
Sent: Tuesday, October 02, 2018 10:07 PM
To: Miller, Bruce
Cc: Dominguez, Alexander
Subject: Re: renewable identification numbers (RINs)

Hey Bruce!!

Sorry I missed this but glad you followed up. In short, we have proposed to address biointermediates in a rule referred to as the REGS Rule. It was proposed in the latter part of the last administration. It's a pretty big rule with some aspects that are worth moving forward, including the biointermediates issue. We will eventually move forward on this, but truth be told, we are a while away from any definitive or immediate actions. The main reason is that the staff that works on the REGs rule and biointermediates is also the staff that works on all the other RFS related actions. I'd be happy to set up a call to discuss more. In the mean time, I'll check in with our technical team to see if they have any more of an update regarding Fulcrum's specific request. I'm looping in Alex to help coordinate a time for a call.

I can't wait to hear about Greece!! Glad y'all had a great time and got away for a proper honeymoon.

Talk soon,

Mandy

Sent from my iPhone

On Oct 2, 2018, at 4:54 PM, Miller, Bruce <Bruce.Miller@mail.house.gov> wrote:

Hey Mandy – Just wanted to follow-up on this if you had a moment or could point me in the right direction? Thanks!!

From: Miller, Bruce
Sent: Monday, September 24, 2018 12:11 PM
To: 'Gunasekara.Mandy@epa.gov'
Subject: renewable identification numbers (RINs)

Hey Mandy – Hope you are well! It's been a bit, our honeymoon was fantastic!! We really enjoyed Greece, sorry we missed Ryders party but didn't get home till after it was over..

Quick question, just wondering if you had any update or anything you could share on this issue. We had constituent company come in to discuss this issue. They had discussion early this year but wondering if any progress was being made or if you could provide some quick insight.

Thought I would reach out on staff level before getting Mark all involved if possible

Short summary is below if you need a refresher on their specific ask.

biointermediates are produced in a two-step process where initial processing takes place at one facility and are then transported to a second facility where they are fully upgraded into a renewable fuel. Today, several companies including Fulcrum BioEnergy which recently began construction on commercial scale biorefinery in Northern Nevada, which is expected to generate 10.5 million gallons per year, are planning to utilize this process with their partners. This process where renewable feedstock suppliers, renewable fuel producers, and obligated parties under the RFS work together would result in the increased production of RINs as well as efforts to diversify the nation's fuel supply with cellulosic biofuels.

However, these biointermediate produces are not currently allowed to generate RINs simply because the EPA's existing definition (40 CFR §80.1401) of a biofuel facility specifies that "*All of the activities and equipment associated*

with the production of renewable fuel starting from the point of delivery of feedstock material to the point of final storage of the end product, which are located on one property (emphasis added), must be under the control of the same person (or persons under common control).” This definition was put into place before a biointermediate product was contemplated and regulatory changes are needed in order for biointermediates to be fully encompassed within the RFS program. Furthermore, biointermediate products are also unable to generate cellulosic RINs because existing EPA regulations explicitly exclude diesel, jet fuel, or heating oil that are derived from co-processing biomass with petroleum.

Bruce F Miller
Chief of Staff
Rep. Mark E. Amodei (NV-2)
Bruce.miller@mail.house.gov
(202) 225-6155

Message

From: DeHart, June [jdehart@manatt.com]
Sent: 2/27/2019 8:15:09 PM
To: Wehrum, Bill [Wehrum.Bill@epa.gov]
CC: Lewis, Josh [Lewis.Josh@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]; Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Re: Kern Oil Refinery - Small Refinery Hardship Waiver

Dear Mr. Wehrum:

I am following up our email exchange regarding the Kern Oil small refinery hardship waiver application that is pending at EPA. Would you be available for a meeting next week with Jennifer Haley, CEO and President, and Bob Winchester, CFO, regarding the application and the ongoing hardship on the company, as 2017 RINs expire at the end of March.

We appreciate your consideration and look forward to hearing from you. Many thanks.

June DeHart
 Partner
 Manatt
 201.585.6510

Sent from my iPhone

> On Jan 7, 2019, at 6:51 PM, Wehrum, Bill <Wehrum.Bill@epa.gov> wrote:

>
 > Ms. DeHart - The entire RFS team is on furlough due to the ongoing funding lapse. I do not anticipate making progress on any waiver applications until funds are restored. Thank you for checking in.

>
 > _____
 > Bill Wehrum
 > Assistant Administrator
 > Office of Air and Radiation
 > U.S. Environmental Protection Agency
 > (202) 564-7404

>> On Jan 7, 2019, at 4:41 PM, DeHart, June <jdehart@manatt.com> wrote:

>>
 >> Dear Mr. Wehrum:
 >>
 >> Last Friday, the attached letter from Kern Oil President Jennifer Haley was delivered to EPA Administrator Wheeler urging a prompt decision on their RFS small refinery hardship waiver. As you know, you advised us in September that the Kern application (filed in July) was complete and under review. EPA's 90 day deadline for a decision is well past due. Kern Oil's 2017 RINs are nearing expiration and further delay of a final decision by EPA continues to cause economic detriment to Kern and threatens to further dilute the value of the exemption. We ask that EPA take final action on Kern's application for the 2017 compliance year.

>>
 >> Many thanks for your review and consideration.

>>
 >> June DeHart
 >> Partner
 >> Manatt
 >> 202.585.6510

>>
 >> <Kern Oil EPA Letter 1.3.19.PDF>
 >> <2018.10.16 - Kern Oil Exemption Request Decision.pdf>

>

Message

From: Appleton, Brooke - OSEC, Washington DC [Brooke.Appleton@osec.usda.gov]
Sent: 11/6/2018 5:19:22 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: RE: Briefing Read-aheads?

Thank you! I appreciate it!

From: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Sent: Tuesday, November 6, 2018 12:12 PM
To: Appleton, Brooke - OSEC, Washington DC <Brooke.Appleton@osec.usda.gov>
Subject: Re: Briefing Read-aheads?

Yes- I'll pull some info together for you.

Sent from my iPhone

On Nov 6, 2018, at 9:27 AM, Appleton, Brooke - OSEC, Washington DC <Brooke.Appleton@osec.usda.gov> wrote:

Hey Mandy,

Do you have any read-ahead material we can use before our briefing with Assist. Adm. Wehrum next week? We'd like to be able to give the Secretary and the Deputy somewhat of a pre-brief. We have our notes from the meeting with you and NEC on October 12th, but I thought if you had something a bit more succinct for us to work off of, that would be helpful. Even an overview of the four sections that we walked through would be helpful. We're hoping to sit down with the Secretary on Thursday.

Thanks in advance!!

Brooke

Brooke S. Appleton
Chief of Staff
Office of the Deputy Secretary

United States Department of Agriculture
Office: (202) 720-6052

<image001.png>

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Message

From: Dominguez, Alexander [dominguez.alexander@epa.gov]
Sent: 11/2/2018 1:18:18 PM
To: Cervino, Victor [Victor.Cervino@amer.mhps.com]
Subject: RE: Touching base re. Section 301 tariffs impact on coal-fired fleet

Victor– Please let me know if any of the times below work.

Wednesday, Nov 7th – 12:30; 1:00

Thursday, Nov 8th – 11:30

Moving Mandy and Clint to bcc.

Best,

Alex Dominguez

Policy Advisor to the Assistant Administrator

Office of Air and Radiation

U.S. Environmental Protection Agency

From: Cervino, Victor [mailto:Victor.Cervino@amer.mhps.com]
Sent: Wednesday, October 31, 2018 11:13 PM
To: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Cc: Woods, Clint <woods.clint@epa.gov>; Dominguez, Alexander <dominguez.alexander@epa.gov>
Subject: Re: Touching base re. Section 301 tariffs impact on coal-fired fleet

Terrific, thanks. Hi Alex, feel free to suggest a few time options that work for y'all.

Victor

On Oct 31, 2018, at 10:09 PM, Gunasekara, Mandy <Gunasekara.Mandy@epa.gov> wrote:

Hi Victor,
 Thank you for the outreach and I'd be happy to meet. I'm looping in Alex to help coordinate the logistics.
 I look forward to chatting soon.
 Best,
 Mandy

Sent from my iPhone

On Oct 31, 2018, at 3:13 PM, Cervino, Victor <Victor.Cervino@amer.mhps.com> wrote:

Dear Mandy and Clint,

I hope this note finds you well. I'd like to meet at your earliest convenience next week or later to chat about the impact Section 301 tariffs will have on the existing U.S. coal-fired fleet. I understand this may sound a bit outside your sandbox, but our folks have been able to track some economic information that we thought you should be aware of to the extent there is an interagency process on this matter. I plan to conduct similar outreach with Secretary Winberg at DOE, given stated priorities for his portfolio.

Thanks in advance, and hope we can chat soon. Take care,

victor

Victor M. Cervino
Senior Manager Government Relations
MHPS Americas, Inc.
202.549.8757 (Cell)

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www.MHPowerSystems.com

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Assistant Administrator Bill Wehrum
Office of Air & Radiation
USEPA Headquarters
William Jefferson Clinton Building
1200 Pennsylvania Avenue, N. W.
Mail Code: 7101M
Washington, DC 20460

RE: Meeting with REG on September 21, 2018

Dear Bill,

As promised, this letter is a follow-up regarding our discussion of using biodiesel distillation bottoms (oleolipids) as feedstock material into the renewable diesel hydro-treating process where REG is respectfully asking for your concurrence.

REG's biodiesel plants produce fuel exceeding the ASTM D6751¹ standard from a variety of low-quality fats and oils, which are RFS2 D4 qualifying feedstock. These feedstock include domestically grown crops meeting the definition of *Renewable Biomass*, animal waste and by-products, and food waste such as used cooking oil. We are able to obtain this high purity of fuel by distilling the crude methyl esters into very pure biodiesel. Oleolipids are residual waste *Renewable Biomass* recovered from the bottom of the distillation column after the separation process has been completed. Chemically, oleolipids are comprised of waxes, sterols, unreacted feedstock (including mono-, di-, and triglycerides), long chain (>C18) methyl esters, and other complex molecules naturally occurring in fats and oils. A typical composition of oleolipids are detailed in the table below. Oleolipids are unacceptable as diesel engine fuel.

<u>Constituent</u>	<u>Composition Range</u>	<u>Composition Typical</u>
Fatty Acid Methyl Esters >C18	10-25%	16%
Glyceride Esters of Fatty Acids	15-35%	20%
Unsaponifiable Lipid Material	40-80%	60%
Free Fatty Acids	2-6%	4%
Ash	<1%	<1%

¹ https://www.afdc.energy.gov/fuels/biodiesel_specifications.html

Oleolipids resulting from production of distilled biodiesel can currently be burned as “bunker fuel” in foreign markets for very little value and soon may have zero or negative value, due to their impurity profile. REG has determined that oleolipids can be an excellent feedstock for conversion into D4 Renewable Diesel through hydro-treating. Renewable Diesel yields will be higher than typical triglyceride feedstocks due to relatively lower oxygen content and glycerin content.

EPA previously characterized waste in the following manner:

“... (3) waste oils/fats/greases ... For the purpose of this rule only, EPA will consider these feedstocks to be “wastes” if they are used as feedstock to produce fuel, but would otherwise normally be discarded or used for another secondary purpose because they are no longer suitable for their original intended use.”²

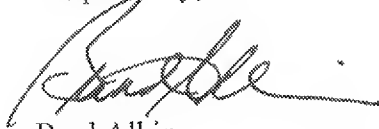
Review of the March 2010 Federal Register indicates that Oleolipids derived from qualifying *Renewable Biomass* and hydro-treated to meet D975 standard Renewable Diesel qualifies for D4 RIN generation under Row F of the look-up table in 40 CFR 80.1426:

- Fuel Type: Renewable Diesel
- Feedstock: Biogenic waste oils, fats, and greases
- Production Process: Hydro-treating

REG expects approximately 8 MMGY of oleolipids from within our own production network to be accessible in the short term. With upgrades at other REG biodiesel facilities we would be able to access an additional 8 MMGY of this waste feedstock.

Again, we fully believe that our fact pattern is consistent with EPA’s original interpretation of waste and we are requesting for your department’s concurrence of the same.

Respectfully,



Brad Albin
Vice President, Manufacturing

Cc: Ben Hangst
Acting Administrator Andrew Wheeler

² <https://www.gpo.gov/fdsys/pkg/FR-2010-03-26/pdf/2010-3851.pdf> (Page 14794)

Message

From: Jeff Sadosky [jsadosky@forbes-tate.com]
Sent: 11/1/2018 3:23:41 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Re: E-15 rule making and consumer education

Hey Mandy, just wanted to circle back on this briefly, know you're probably slammed, but wanted to see if we could pop back in in next few weeks to chat through the E-15 rulemaking process and potential that it might include something regarding consumer education.

Thanks,
Jeff

From: Jeffrey Sadosky <jsadosky@forbes-tate.com>
Date: Monday, October 29, 2018 at 12:41 PM
To: "gunasekara.mandy@epa.gov" <gunasekara.mandy@epa.gov>
Subject: E-15 rule making and consumer education

Mandy,
In early September, we had pulled a few of the small engine manufacturers together for a meeting with your team re the possibility of full year E-15 and our concerns about what this would do to consumers. During that meeting the National Marine Manufacturers Association discussed some ideas we had around consumer education, and now that you're now starting the rulemaking process and this is no longer a question of if/when President Trump announces the expansion to year-round, we hoped you might have some time to sit back down with Nicole Vasillaros, NMMA's head of office here in DC, about how the EPA rulemaking process might speak to the consumer education question.

Is there some time in the next few weeks that might work on your end? Thanks in advance and hope to connect again soon.'

Best,
Jeff

Jeffrey C. Sadosky
Forbes Tate Partners
777 6th Street NW
8th Floor
Washington, DC 20001
(202) 340-8586 cell

Message

From: Mike Cashin (MP) [MCASHIN@mnpower.com]
Sent: 10/22/2018 8:55:27 PM
To: Culligan, Kevin [Culligan.Kevin@epa.gov]; Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: RE: ALLETE (Minnesota Power) Meeting request to discuss Affordable Clean Energy Act provisions with EPA staff

Thank you Kevin and Mandy,
 I arrive late morning in DC tomorrow, so the 2:30 PM Tuesday meeting time works well.

Mike

From: Culligan, Kevin [mailto:Culligan.Kevin@epa.gov]
Sent: Monday, October 22, 2018 3:52 PM
To: Mike Cashin (MP) <MCASHIN@mnpower.com>; Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Subject: RE: ALLETE (Minnesota Power) Meeting request to discuss Affordable Clean Energy Act provisions with EPA staff

[ALERT – External Email – Handle Accordingly]

Mike,

Thanks for the follow-up. I can meet tomorrow at 2:30. I will relay anything we chat about to Mandy. Best way to get here is to come to the entrance by the Federal Triangle metro (on 12th). Use the north entrance (away from mall/towards Pennsylvania Avenue). Guard will call up to my desk. You'll need my number: Personal Phone / Ex. 6

- Kevin

From: Mike Cashin (MP) [mailto:MCASHIN@mnpower.com]
Sent: Friday, October 19, 2018 4:18 PM
To: Culligan, Kevin <Culligan.Kevin@epa.gov>; Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Subject: ALLETE (Minnesota Power) Meeting request to discuss Affordable Clean Energy Act provisions with EPA staff

Kevin and Mandy,

Minnesota Power (ALLETE) has been reviewing EPA's proposed Affordable Clean Energy rule and would like to meet with EPA staff to discuss some areas that we see warrant particular consideration by EPA as ACE rulemaking proceeds. I plan on being in Washington, DC to attend an event, "Insights into Environmental Law & Policy: A Conversation with Key Regulators" the afternoon of Wednesday, October 24 and welcome the opportunity to meet with EPA when in DC around that timing. I can also adjust my travel plans to accommodate EPA available during other times.

One area of concern with the proposed ACE rule is proper recognition and integration of how heat rate shifts across the load range of an operating unit. Shifting from lowest turndown load to peak load to support energy demand under ISO economic dispatch has become an increasingly frequent component for supporting electricity grid, energy and reliability support needs. Another concern stems from how utilities' expanding deployment of variable renewable energy resources is translating to the need to provide for compensating measures by more frequently varying the output of load following resources, essential to supporting reliability. When we meet, I will share information about a "Load Bins" approach we are refining that can address ACE compliance management during load range shifts on our generating units and related heat rate performance, with and without the overlay of ACE BSER Heat Rate Improvement measures. I will also share information about how more granular (e.g. sub one minute to five minute) operational data and modeling is exhibiting a more pronounced need for preserving load following capability on generating units that, previous to larger scale variable renewable energy deployment, were more typically operating for base load.

I look forward to the opportunity to meet soon.

Best regards,

Mike

Michael G. Cashin

Michael G. Cashin, PE
Environmental Policy Advisor
Minnesota Power (ALLETE)
30 W. Superior St.
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mcashin@mnpower.com
218-355-3339
Cell 218-349-9463

Message

From: Appleton, Brooke - OSEC, Washington DC [Brooke.Appleton@osec.usda.gov]
Sent: 10/11/2018 4:03:15 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
CC: Johansson, Robert - OCE [RJohansson@oce.usda.gov]
Subject: Consultation on RVO Rule?

Mandy,

I hope all is well. We are hearing that the 2019 RVO rule will possibly be going out for inter-agency review on or around October 29th. If you're amenable to it, we'd like to sit down next week and get an overview on where you are and where you are headed on the overall rule. It would also provide an opportunity to talk through some of the parts where we may disagree. From our perspective, this is helpful two-fold, it will show we are working together in a collegial fashion and it will also help keep your tight timeline if in fact your goal is to get it out for inter-agency review by Oct. 29th.

I think we could keep this meeting low key, maybe just you and a few of your staff, me and our Chief Economist, who I've cc'd here.

Let me know what day(s) might work next week and we will make ourselves available.

Thanks so much!

Brooke



Brooke S. Appleton

Chief of Staff
Office of the Deputy Secretary

United States Department of Agriculture
Office: (202) 720-6052

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Message

From: Williams, Brendan [Brendan.Williams@pbfenergy.com]
Sent: 11/1/2018 2:30:17 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
CC: Schwab, Justin [Schwab.Justin@epa.gov]
Subject: RE: Connect
Attachments: 20180524 PBF Cmt to EPA on Revised DCU Water Over Stds FINAL SIGNED.pdf; 20180725 RSR DCU Q&A FINAL.docx

Thanks! Will reach out to our counsel, but in the meantime, p. 12-13 of our attached comments touches on the compliance time frame. Some had raised the Plywood case to us previously, so we addressed that case in the second "Q&A" item in the second attachment. If there are other relevant cases we should evaluate and you could forward them, it would be greatly appreciated.

Will reconnect soon. Thanks again!
Brendan

-----Original Message-----

From: Gunasekara, Mandy [mailto:Gunasekara.Mandy@epa.gov]
Sent: Thursday, November 1, 2018 9:29 AM
To: Williams, Brendan <Brendan.Williams@pbfenergy.com>
Cc: Schwab, Justin <Schwab.Justin@epa.gov>
Subject: Connect

EXTERNAL EMAIL: If unknown sender, Do Not click links/attachments. Never give out your user ID or password!

Ccing Justin so we can all connect with the right folks.

Sent from my iPhone

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May 24, 2018

Ms. Penny Lassiter
U.S. EPA
109 T.W. Alexander Drive
Mail Code: E143-01
Research Triangle Park, NC 27709

Subject: EPA Proposed Revision to National Emission Standards for Hazardous Air Pollutants and
New Source Performance Standards: Petroleum Refinery Sector Amendments
Comments on Proposed Revision to 40 CFR 63.657(e)
Docket EPA-HQ-OAR-2010-0682

Dear Ms. Lassiter,

PBF Energy (PBF) appreciates the opportunity to provide comments concerning the Agency's proposed revisions to the *National Emission Standards for Hazardous Air Pollutants and New Source Performance Standards: Petroleum Refinery Sector Amendments*, published in the *Federal Register* on April 10, 2018. 83 Fed. Reg. 15458. PBF's comments specifically relate to EPA's proposed substantive revision to 40 CFR Part 63.657(e) of the Refinery Sector Rule ("RSR"). PBF opposes EPA's proposal to impose a significant new regulatory obligation requiring installation and operation of disengaging/separator drums in conjunction with water overflow systems used with Delayed Coking Units (DCUs). EPA's proposal would impose significant burden on certain affected facilities without any corresponding environmental benefit, is based on insufficient analysis of relevant information, is inconsistent with the Agency's MACT floor analysis, and fails to satisfy applicable standards governing substantive and significant regulatory changes.

Within its proposed revision to the RSR standards, EPA states that it is "proposing to add provisions to 40 CFR 63.657(e) requiring the use of a separator or disengaging device operated in a manner to prevent entrainment of gases from the coke drum vessel to the overflow water storage tank." This proposed regulatory revision would impose a significant step-change for certain existing DCU operators, as disengaging/separator drums are not required under the current rule. As addressed in detail below, such additional burden would not achieve any material reduction in hazardous air pollutant ("HAP") emissions compared to current control requirements. In fact, existing data in the Docket confirm that current water overflow techniques (without a disengaging device) achieve a substantial reduction in HAP emissions, even surpassing the control limit of 2 psig otherwise imposed in Section 63.657(a). Water overflow systems displace to the blowdown system for control the majority of vapor space (and HAP emissions) within the coke drum, until water exits. Application of EPA emission factors -- specifically developed to calculate emissions from DCU steam vents -- reveal that water overflow events result in minimal HAP emissions (significantly less than 1 ton per year for benzene), even in the absence of *any control* of the vent stream. The requirement under the current regulation for hard-piped conveyance and submerged fill into a storage tank (which are approved organic vapor control techniques currently required by EPA within at least two MACT standards) will achieve substantial further HAP emission reduction from this low uncontrolled emissions level.

In addition, EPA's proposal to require use of a disengaging/separator drum for existing water overflow systems appears to be based on a single email communication from one company, without further investigation into the prevalence of the use of this technology. EPA has apparently undertaken no additional evaluation of the relative extent of the use of disengaging/separator drums in conjunction with water overflow systems for existing DCUs. Indeed, EPA did not seek such information in the context of its 2011 information collection request ("ICR"). This lack of analysis accounts for EPA's misperception that such equipment is already in use in virtually all refinery settings in which water overflow systems are used with DCUs.

Similarly, EPA's analysis of the reported emission benefits is based on equally insufficient analysis. It appears that EPA has merely accepted the general assertion in the context of public comments in opposition to the water flow option that use of a disengaging/separator drum will achieve material reduction in HAP emissions. EPA's proposed rulemaking reflects the complete absence of any adequate collection or analysis of information on these fundamental points, and is wholly inadequate to justify a material change in the imposition of control requirements under RSR. Moreover, the proposed change is not consistent with the MACT floor analysis specifically performed by EPA for this equipment and made available for public comment.

In fact, contrary to EPA's assumption, affected refineries in some instances utilize water overflow systems in conjunction with existing DCU operation without use of an associated disengaging/separator drum. Such systems achieve effective HAP emission control without significant operational burden and capital expense that would be required for installation of the new equipment. In this context, the proposed new requirement would impose on multiple sources the need to re-engineer the system, design and install new equipment, secure requisite permits and implement operational changes to achieve compliance with the proposed material change in compliance obligation. These multiple tasks would require at least several years to complete; it thus would not even be possible for such sources to accomplish all required actions in advance of the currently-applicable compliance date.

This comment letter discusses the benefits of coke drum cooling using water overflow techniques, the associated reduction in HAP emissions, the effectiveness of submerged fill in controlling VOC emissions, the implications of quenching in an open top tank of any HAP concentrations entrained in hot water, application of EPA models to calculate benzene emissions from open top tanks, and the consequences of reconfiguration of existing DCU blowdown systems in relation to MACT floor applicability.

Water Overflow and HAP Emission Reduction

It cannot be disputed that water overflow displaces available vapor space in the coke drum. Less available vapor space equates to less potential for HAP emission generation during coke drum openings. The coker blowdown system operates continuously, recovering steam and hydrocarbon vapors during this vapor displacement period, until the water level reaches the top of the drum and overflows. Once water overflows the drum, the pumping continues until the drum reaches an internal temperature of 220°F or less before opening.

Existing DCUs using water overflow effectively control HAP emissions by displacing the majority of vapors to the blowdown system. All vapors continue to the blowdown system until water fills the drum completely. Once the drum is full of water, it overflows into a collection system (hard pipe and storage tank) for reuse, such as cutting water or quench water.

In the context of the RSR rulemaking record, EPA s recognized the benefits of water overflow in the preamble to the 2015 final RSR: “Based on saturated steam properties, we determined that an overhead temperature of 220 °F would achieve equivalent or greater emissions reductions than a 2 psig pressure limitation.”

Water overflow of a coke drum also provides important, enhanced safety protection to reduce refinery operator exposure to potential hazards, such as hot steam, hydrogen sulfide, and benzene emissions.

In the context of best practices for operation of DCUs using water overflow techniques, operators are subject to routine industrial hygiene monitoring programs that collect information on possible benzene exposures² during the working shift. Results from such programs have repeatedly shown that operator exposures to benzene (directly over the exposed drum opening, sluiceway, and overflow water tanks) are orders of magnitude below the OSHA exposure limit of 1.0 ppm, at 0.003 ppm (300 ppb) and less, to the extent even detectable. Such occupational monitoring of benzene clearly demonstrates the extremely low levels of benzene in the areas nearest to the drum and water overflow systems, which can be correlated to low source levels of benzene from the DCU overflow.

Therefore, both the Agency’s own prior assessments (in the context of promulgating the existing standards applicable to water overflow operations for existing DCUs) and occupational monitoring in close proximity to DCU operation reveal that proper use of water overflow results in minimal concentrations of benzene in the water discharged from the DCU drum. The low concentrations of benzene at the point of discharge severely limit the availability of benzene to potentially generate emissions during the water overflow activity.

Water Overflow Further Reduces HAP Emissions

Based on EPA emissions data, water overflow operations at existing DCUs emit very low rates of benzene, even prior to application of the control requirements imposed through the existing rule.

EPA has compiled in the Docket multiple memoranda³ addressing pollutant emission rates from coke drum steam vents. These memoranda report that air pollutants from the steam vent are likely to include light organics (methane, ethane, and propane), but may also include light aromatics (like benzene). The memoranda also report EPA’s conclusion that its original gas depressuring model used to determine coke drum air pollution emission rates for NSPS Subpart Ja and Greenhouse Gas regulations overstated projected emission rates, for the following reasons:

1. There is little gaseous void space in the coke drum because it is filled with water, and
2. There is significant generation of steam during the depressuring process due to the boiling point of water.

Based on consideration of additional information, EPA concluded that air pollution emission rates from this process are best characterized as a function of steam generation³. As the coke drum depressurizes, additional steam will be generated until the water in the drum falls to 212°F.

The following is the heat balance equation EPA used to determine the mass of steam generated during coke drum depressurization³:

$$M_{stream} = \frac{(1 - f_{ConvLoss}) \times (M_{water} \times C_{p,water}) + (M_{coke} \times C_{p,coke}) \times (T_{initial} - T_{final})}{\Delta H_{vap}}$$

Where:

M_{steam} =	Mass of steam generated and released during vessel depressurization and opening, pounds (lb).
ΔH_{vap} =	Heat of vaporization of water, British thermal units per pound (Btu/lb).
$f_{ConvHeatLoss}$ =	Convective heat loss from sides of the coke vessel, Btu.
M_{water} =	Mass of water in the coke vessel prior to depressurization and opening, lb.
$C_{p,water}$ =	Heat capacity of water, British thermal units per pound per degree Fahrenheit (Btu/lb/°F).
M_{coke} =	Mass of petroleum coke in the coke vessel prior to depressurization and opening, lb.
$C_{p,coke}$ =	Heat capacity of petroleum coke, Btu/lb/°F.
$T_{initial}$ =	Average temperature of the coke drum when the drum is first vented to the atmosphere, °F.
T_{final} =	Temperature of the coke drum when steam generation stops = 212°F.

PBF used this equation to calculate the amount of steam generated from the start of a water overflow event, since the DCU blowdown system is in full operation until the water reaches the top of the drum and is isolated.

The following input variables were identified to reflect DCU operation using water overflow. Since the mass of water and coke are variables that change frequently based on DCU operation, we used a range of values to calculate steam production:

M_{steam} =	Mass of steam generated and released during vessel depressurization and opening, pounds (lb)
ΔH_{vap} =	960 Btu/lb
$f_{ConvHeatLoss}$ =	0.10 Btu
M_{water} =	563,635 to 1,146,443 lbs
$C_{p,water}$ =	1.0 Btu/lb/°F
M_{coke} =	812,911 to 1,653,477 lbs
$C_{p,coke}$ =	0.265 Btu/lb/°F
$T_{initial}$ =	250 °F
T_{final} =	212°F

The calculated rate of steam for these water overflow examples range from 9,056 to 18,419 lbs/cycle. EPA also identified a benzene emission factor correlated to the amount of steam produced³: 0.039 lbs of benzene per 1,000 lbs of steam generated. Applying this emission factor to the calculated steam generation rates yields projected benzene emission rates ranging from 0.35 to 0.72 lbs/cycle.

These calculation results correlate well with actual emission test data collected by EPA from operating DCUs through the 2011 ICR. Results for benzene emissions were summarized in a technical memorandum⁴ that reported values ranging from 0.012 to 0.76 lbs/cycle DLL (DLL means detection level limited, with 1 or 2 runs below method detection limit for benzene). Accordingly, calculation of uncontrolled benzene emission levels based upon EPA's equation and relevant input parameters corresponds closely to the high end of benzene concentrations actually measured and reported to EPA in

connection with regulatory development efforts. These results clearly support the contention that, for purposes of EPA's analysis of HAP emission projections relevant to the RSR, reliance upon the foregoing calculation methodology developed by EPA provides a conservative basis for such assessment.

This conservative but defensible emission estimation methodology can be applied to common industry practices related to coke drum operation associated with water overflow methods to project uncontrolled level of benzene emissions from such activity. Based on industry practice, a representative range of coke drum openings may vary between 600 and 3,000 cycles per year. Applying these values to the calculated factors, annual benzene emissions from water overflow events would range from 0.18 to 0.55 tons per year.

Significantly, these very low calculated benzene emission rates reflect the projected benzene emission levels *prior to* the reductions that would be achieved through application of the current regulatory standards. The current regulatory standard requires that a DCU operated with the water overflow method must use hardpipe to convey the flow to the point of submerged fill. As the Agency's own prior analyses have confirmed, such operational requirement will achieve significant reductions in HAP emission rates. The foregoing calculation demonstrates that the uncontrolled benzene emission rate in such circumstances will be extremely low, and such analysis confirms that the Agency's prior determination to impose requirements for water overflow operations at existing DCUs – consisting of hard pipe and submerged fill – will result in extremely low emission rates that cannot warrant further substantial emission control technology requirements.

Benzene Emissions from Quiescent Surfaces

Hot water overflow that is hard-piped for discharge into a storage tank using submerged fill will create a quiescent surface. Submerged fill prevents liquid agitation, consistent with current EPA requirements for techniques to reduce organic vapor emissions from industry operations involving organic materials present within liquids stored in tanks.

Organic emissions from surface impoundments and open top tanks originate from the uncovered liquid surface that is exposed to the air. As acknowledged by the Agency in promulgating the current standards applicable to DCU operations, the hot water/steam stream from the coke drum water overflow event will cool and condense within the contents of the storage tank. The condensed organics will mix with the liquid contents (mainly water) in the tank.

EPA has developed and endorsed numerous emission models⁵ to calculate volatile organic compound emissions from open liquid surfaces, including open top tanks. The models conservatively assume no significant volatile organic compound removal by biodegradation, seepage, adsorption, or other forms of degradation.

The formula to calculate emissions of volatile constituents from a liquid surface includes the overall mass transfer coefficient (K), liquid-phase mass transfer coefficient (K_L), the gas phase mass transfer coefficient (K_G), and Henry's Law constant (H_L). The liquid-phase mass transfer coefficient (K_L) is a function of the constituent's diffusivity in water, the wind speed, and depth of receiving liquid. The gas-phase mass transfer coefficient (K_G) is a function of wind speed and effective diameter of the liquid surface. Henry's Law constant is calculated by dividing the constituent's partial pressure by its solubility in water.

Using the following input variables to the EPA model and a measured benzene concentration of 100 ppb⁶, the equation predicts an annual benzene emission rate of 0.02 lbs/year from an open top water storage tank. The calculations for this example are as follows.

Liquid-Phase (K_L):

$$K_L = (2.605 \times 10^{-9} \times FD + 1.277 \times 10^{-7}) \times U^2 \times [D_W/D_e]^2$$

Where:

FD = Effective diameter of tank at 9.6 meters (20m diameter, 3.7m deep)
 U = Wind speed at 4.47 m/s
 D_W = Diffusivity of benzene in water at $9.8 \times 10^{-6} \text{ cm}^2/\text{s}$
 D_e = Diffusivity of ether in water at $8.5 \times 10^{-6} \text{ cm}^2/\text{s}$
 K_L = $2.96 \times 10^{-6} \text{ m/s}$

Gas-Phase (K_G):

$$K_G = 4.82 \times 10^{-3} \times U^{0.78} \times Sc^{-0.67} \times De^{-0.11}$$

Where

U = Wind speed at 4.47 m/s
 Sc = Schmidt Number for benzene gas at 1.71
 De = Effective diameter of the tank at 9.6 m
 K_G = 0.008437 m/s

Mass Transfer (K):

$$\frac{1}{K} = \frac{1}{K_L} + \frac{1}{K_{eq} * K_G}$$

Where:

K_L = $2.96 \times 10^{-6} \text{ (m/s)}$
 K_{eq} = 0.225 (constant for benzene)
 K_G = 0.008437 (m/s)
 K = $2.95 \times 10^{-6} \text{ (m/s)}$

The final estimate of benzene emissions from a well-mixed system would be:

$$QC_i = KC_oA + QC_o$$

$$C_o = \frac{QC_i}{KA + Q}$$

Where:

Q = Flow rate (0.006263 m/s)
 H = Retention time (50 hrs)
 V = Volume of the tank (1,128 m³)
 A = Area of tank (308 m²)
 C_i = Benzene concentration at 0.0004 g/m³ (100 ppb)

$$Q = \frac{1,128 \text{ m}^3}{50 \text{ hrs}} \times \frac{1 \text{ hr}}{3,600 \text{ sec}}$$

$$C_o = \frac{0.006263 \times 0.0004}{2.95 \times 10^{-6} \times 308 + 0.006263}$$

C_o = 0.0072 g/m³

Benzene emissions from the tank would be 0.0000065 g/s or 0.02 lbs/yr:

$$KC_o \times A$$

$$2.95 \times 10^{-6} \times 0.0072 \times 308 = 0.0000065 \text{ g/s}$$

Therefore, by applying a well-established EPA emission estimation methodology for calculating volatile organic compound emissions from an open top water storage tank (which reflects certain conservative assumptions inherent in such methodology), the current regulatory obligation under Section 63.657(e) (use of hard pipe conveyance and submerged fill for the water overflow compliance option) would result in only 0.02 pounds of benzene emissions per year from compliant and representative DCU operations. It is therefore wholly unnecessary to propose additional emission control requirements in the form of a disengaging/separator drum for this operational mode. Instead, the Agency's proposed revision to Section 63.657(e) of the RSR would result for certain facilities in substantial capital commitment, operational interruption and an extended compliance timeframe, while achieving wholly insignificant (if any) further HAP emission reductions relative to the existing standard.

Submerged Fill Control Technology

In the context of its proposal to impose additional control equipment standards for water overflow operation, EPA fails to acknowledge or evaluate the effectiveness in controlling HAP emissions of the standards currently imposed through the existing rule. Yet, EPA expressly described such standards in the context of promulgating the DCU provisions of RSR, as follows:

[C]oke cooling must hard pipe the overflow water or otherwise prevent exposure of the overflow water to the atmosphere when transferring the overflow water to the overflow water storage tank whenever the coke drum vessel temperature exceeds 220 degrees Fahrenheit. The overflow water storage tank may be an open or fixed-roof tank provided that a submerged fill pipe (pipe outlet below existing liquid level in the tank) is used to transfer overflow water to the tank.

EPA further evaluated any potential concern related to HAP emissions associated with water overflow techniques, and concluded that the standards imposed by the final rule effectively resolved any such concerns:

With respect to the overflow “drain,” we remain concerned with emissions from draining superheated water. However, if submerged fill is used in the atmospheric tank receiving the overflow water, the superheated water will be cooled by the water within the tank and emissions that occur during the conventional draining of water (from the flashing of superheated water into steam) can be prevented.

In addition, emission factors used to calculate organic vapors from loading operations (saturation factor) indicate approximately 200% reduction in organic vapor emission rates using submerged fill when compared to splash loading. See AP-42 Section 5.2 - Transportation and Marketing of Petroleum Liquids.

In addition, EPA has relied and continues to rely in many regulatory contexts on submerged fill as a method of organic vapor emission control. For example, EPA relies upon submerged fill for organic vapor and benzene control in the following MACT standards:

1. Subpart Y - National Emission Standards for Marine Tank Vessel Loading Operations, Section 63.560(4);
2. Subpart BBBB - National Emission Standards for Gasoline Distribution Bulk Terminals, Section 63.11086(a).

Information in the Docket¹ also discusses the physics behind EPA’s decision to allow water overflow, recognizing the reduction in steam production and HAP concentration using submerged fill:

Submerged fill will prevent atmospheric exposure of superheated water and allow cooling of the overflow water as it mixes with the tank contents. Therefore, we have revised the provisions of the rule to expressly allow water overflow DCU to discharge water to an atmospheric tank provided that submerged fill pipe (pipe outlet below the existing water level in the tank) is used.

It is therefore clear that EPA had not failed to evaluate issues related to DCU operation and water overflow practices when originally promulgating the DCU standards under RSR. Instead, review of EPA’s own prior discussion of these issues relevant to HAP emissions control associated with water overflow activity clearly reveals that EPA’s current proposal to require a disengaging/separator drum prior to the storage tank to control HAP emissions is entirely inconsistent with the Agency’s previous analysis in support of the currently applicability standards. Indeed, EPA had correctly reached the original conclusion that submerged fill will quench the hot water from the hard-piped water and control organic HAP emissions from DCU water overflow activities. EPA has not identified any information or technical justification for reversing this conclusion.

As the Agency is aware, the depth of the submerged fill pipe in relation to the surface of the liquid also is important relative to the extent of emission reduction. The pressure exerted on the discharged fluid increases with the depth of the point of discharge, because of the weight of fluid above it. Engineering references report a pressure increase of 0.445 psi/foot (for water). For example, if the discharge pipe is five feet below the surface, then 2.2 psi is exerted on the fluid at the discharge point.

The filling of a coke drum takes time, since water flowing into the drum is converting to steam, cooling the drum, and exiting through the enclosed blowdown system at the top that operates at 5 psi and less. The water level rises as the drum cools, until it reaches the top. Operators close-off the blowdown system to prevent water and coke fines from entering, and water begins to overflow. There is very little increase in drum pressure during this process, since the closing of the blowdown valve and water overflow commences quickly. The water overflow process reduces the pressure in the drum to less than 5 psig. This fluid pressure will meet resistance at the discharge location of the submerged pipe. The cool water in the tank, plus the additional pressure will help condense steam and organic vapors in the hot water overflow stream. This case is even more simplistic for submerged fill for DCUs, since the majority of the fluid from the drum is hot water. Accordingly, it is clear that submerged fill – at the proper depth – will ensure effective emission control when adding volatile organic compounds to a sufficient quantity of water.

To the extent that the existing text of Section 63.657(e) does not expressly ensure the proper application of submerged fill techniques in this context, EPA could effectively clarify and ensure the emission control benefits of submerged fill operation by including in the existing regulation language from other EPA regulations requiring submerged fill, such as the definition of “submerged filling” provided at 40 CFR Section 63.11100.⁷

Based upon these well-established considerations expressly recognized by EPA as effective for controlling organic emissions through the requirement for submerged fill, EPA should continue to authorize submerged fill as a control technique for organic vapor control.

The analysis presented in this comment letter confirms that the existing control obligations imposed by EPA on water overflow systems ensures effective control of HAP emissions from existing DCU operations, in a manner consistent with EPA’s MACT floor analysis, and that the additional proposed control requirement cannot achieve significant further reduction in such HAP emissions.

Quenching of Hot Water

The energy transfer effects from the cooling of hot water discharged into a body of colder water, in this case a storage tank, can be proven through thermodynamic principles. Using the following example, we can calculate the temperature increase of the cold water storage tank due to hot water inlet flow;

- Cold tank capacity is 300,000 gallons
- Beginning hot water temperature is 250°F
- Ending hot water temperature is 212°F
- Water overflow rate is 1,000 gpm

Using the following general thermodynamic equation, a minimal increase in cold water storage tank temperature can be calculated for this event.

$$Btu/Hr = 500 \times GPM \times \Delta T$$

Where:

500 = Approximate conversion factor for water specific heat
 GPM = Gallons per minute of the water overflow
 Delta T = Change in temperature of the water. In this case 38°F (250-212°F)

This example generates about 19 MM BTU/HR of energy. Since the water overflow duration is approximately 90 minutes, the value will be 28.5 MMBTU.

Assuming a tank holding 300,000 gallons of water and recognizing that 8.3 BTUs of energy are required to raise one gallon of water 1°F, approximately 2.5 MMBTU ($8.3 \times 300,000 \times 0.000001$) would be required to raise the water in the tank by 1°F. The water overflow process generates 28.5 MMBTU; therefore, the entire water overflow event would raise the tank contents by 11.4°F. This does not even account for heat loss through the surface liquid or uninsulated tank steel walls during the event.

Therefore, the requirement to direct by hard pipe the overflow water from the DCU for submerged fill into a significant quantity of water ensures the effectiveness of quenching hot water in an aboveground open top storage tank, based on the minimal increase in tank water temperature after the water overflow event. Quenched water will mix with tank contents, including organic compounds. Resultant benzene emissions, if any, will therefore be insignificant.

Disengaging/Separator Drum May Result in Increase of Other Air Pollutant Emissions and Pose Safety Concerns

In some cases, existing DCUs cannot meet the 2 psig requirement specified in Section 63.657(a) without significant reconfiguration/modification of the associated blowdown system. Such cases are more likely to result in reliance by operators on the water overflow compliance method. For these same units, any new disengaging/separator drum could not be vented to the existing blowdown system, and instead would require another compliant off-gas control device. For this situation, the compliant off-gas control device would likely be the refinery flare system. In addition, the off-gas from the disengaging/separator drum would require enrichment with refinery fuel to maintain low oxygen content to prevent ignition of the vent gas in the flare system. The extra fuel will increase criteria air pollutant emission rates from the refinery flare.

A disengaging/separator drum connected to a refinery flare system also requires a significant amount of process safety controls and redundant operating systems to prevent loss of containment or fire. The refinery must follow all industrial standards for vessels connected to the flare, including API Standard 521 for compliance with OSHA Process Safety Management 29 CFR 1910.119. This standard specifies for selecting and designing disposal systems, including such component parts as piping, vessels, flares and vent stacks. API Standard 521 is also very specific in identifying fluid properties that influence selection and design, such as:

- Physical, chemical, and reactive properties,
- Temperature,
- Hazardous and nuisance properties,
- Viscosity and solidification,
- Miscibility, and
- Recovery value.

Installation of a new vent line from the disengaging/separator drum would also require hot work on an active flare line, which is extremely dangerous.

For these reasons, for existing DCU configurations that do not include disengaging/separator drums, the proposed new regulatory requirement may result in an increase in indirect air emissions related to the need for additional flare connection, and pose unnecessary operational safety considerations related to such flare connection. The limited analysis conducted by EPA in the context of the proposed regulation in no way considers or addresses these potential consequences.

EPA's Proposed Regulatory Revision is Based on Incomplete and Inadequate Analysis

In the context of proposing a new regulatory requirement for the management of emissions associated with the water overflow method for existing DCUs, EPA reports that such disengaging/separator drums are common and "typically" used with existing DCUs using the water overflow method.

"As separators appear to be an integral part of the water overflow system design, we are not projecting any capital investment or additional operating costs associated with this proposed amendment."

However, in support of its assertion of the commonplace nature of this configuration, EPA identifies only a single reported equipment configuration condition from an individual refinery. Based on a review of the Docket compiled by EPA in support of this rulemaking, EPA has identified no additional information supporting any conclusion regarding the prevalence of the use of disengaging/separator drums in conjunction with existing DCU operation.

The absence of such information is not surprising, since the Agency's ICR effort underlying the rulemaking did not even request such information. In fact, Section 7 of the ICR for DCUs only addressed a general selection of blowdown systems used to manage the stream exhausted during steam purge and water quench cycles prior to venting the drum to atmosphere; none of the nine general selections for DCU blowdown systems involved the use of a disengaging/separator drum.

Similarly, EPA's analysis of the emission consequences associated with imposition of the proposed new standard appears to constitute mere adoption of a public comment made in opposition to the existing water overflow standard in Section 63.657(e). Neither the proposed rule nor the Docket generally includes any detailed analysis of the relevant air emission consequences of compliance with the existing regulatory standards imposed for water overflow operation in comparison to incremental emission reductions, if any, related to the imposition of the new, significant capital requirement for additional equipment.

Further, EPA's MACT floor analysis neither addresses nor supports the proposed imposition of an additional equipment control requirement relative to the degree of HAP emission control that can be expected from the existing regulatory standard. Instead, EPA in no way undertakes to perform an updated MACT floor analysis. Indeed, EPA's uninvestigated assumption that existing DCU systems using the water overflow method "typically" include disengaging or separator drums either demonstrates that EPA has not performed an appropriate MACT floor analysis, or dictates that any existing DCU utilizing the water overflow method and *not currently equipped with a disengaging/separator drum* should not be considered within the same source category as those for which EPA performed any appropriate MACT floor evaluation.

In short, EPA's proposal to require existing DCUs to demonstrate compliance with the water overflow method of operation by installation and use of disengaging/separator drums appears to be based solely upon an assertion regarding emission impacts raised by a public commenter and identification of a single instance of the existing use of such equipment at a specific facility. Such analysis is wholly inadequate relative to EPA's regulatory obligations and established practice for determining to impose additional emission control technology requirements under any MACT standard.

Contrary to EPA's underlying presumptions, the proposed regulatory change would not merely codify existing practice in all cases, but would instead impose significant additional requirements for certain affected sources. Also, contrary to EPA's presumptions, such additional control requirements would not result in any material reduction in HAP emissions relative to the existing control standards. Indeed, under at least certain operating conditions, incidental emission increases necessitated by compliance with the proposed new standard (due to required reconfiguration of equipment) could more than offset any minimal HAP emission reductions realized by the additional requirement.

It is Not Possible for Certain Affected Sources to Achieve Compliance with the Proposed New Requirement by the Applicable Regulatory Deadline

Consistent with its lack of detailed analysis of both the burdens and benefits of a proposed new compliance obligation related to the installation of disengaging/separator drums in conjunction with water overflow operation for existing DCUs, EPA completely fails through the proposed rule to evaluate the compliance steps necessary for existing sources to satisfy any such standard, and the associated schedule for such compliance steps. As demonstrated below, where operators intended to achieve compliance with the applicable DCU standards by reliance on the water overflow method as currently established through Section 63.657(e), and where such existing DCUs are not otherwise currently equipped with disengaging/separator drums, the required engineering, installation, permitting and shakedown steps necessary for satisfaction of the proposed requirement would preclude compliance by January 2019.

For existing DCU systems not equipped with disengaging/separator drums, compliance with EPA's proposal would require engineers to redesign the final overflow system to accommodate a new disengaging/separator drum, by addressing the following considerations, at a minimum:

1. Vessel size and construction (coded pressure vessel and time to build)
2. Vessel controls and instrumentation (level indicators, safety valves, PHA requirements)
3. Vessel ancillary equipment (pumps, electrical load)
4. Vessel location on the DCU (if space is available, maintenance access)
5. Vessel off-gas control to the flare system (enrichment, safety controls)
6. Preconstruction and operating permits
7. DCU shutdown for installation

The engineering of the vessel raises many complexities that will need to be resolved before progressing with the permitting and detailed engineering. The determination of the vessel placement in an existing unit can be complicated based on congestion and tie-in points to existing systems. The basic engineering required before a permit application can be submitted is at least 6 months; permit application review and permit issuance requires another 6 to 12 months in many jurisdictions. In addition, the Coker unit will also require a shut down in order to make tie-ins to the existing systems that are in service and cannot be

isolated safely.⁸ Therefore, the projected schedule to properly design, procure and install a vessel is likely 24-36 months.

This summary discussion of necessary scheduling steps and timeframes clearly demonstrates that it would not be possible at this point for an operator to achieve compliance with the proposed control requirements applicable to DCUs under RSR by the current compliance deadline if the operator must engineer and install a new disengaging/separator drum for an existing DCU. Moreover, such operator would have already expended significant resources to plan for and ensure timely compliance with the currently applicable standards imposed under Section 63.657(e) based on the obligations imposed by EPA for such operational situations through the original RSR requirements for DCUs.

Section 112 of the Clean Air Act expressly recognizes that the application of MACT-level controls for existing sources may necessitate that EPA afford a reasonable compliance timeframe to allow for the planning and retrofit of existing equipment to meet any new standard. Indeed, Section 112(i)(3)(A) of the Clean Air Act expressly provides for EPA to establish a compliance date for existing sources that may extend for three years after the effective date of the standard, in order to accommodate the specific burdens imposed on existing sources that must be reconfigured to satisfy a new compliance standard. Those burdens, recognized under the statute to be applicable to any existing source requiring reconfiguration, are significantly amplified in the situation where an operator of an affected source has already undertaken and is in the process of implementing a strategic plan to achieve compliance by the relevant effective date with the compliance obligation *previously established by EPA for such source under the same MACT standard*.

For all the reasons discussed herein, EPA should determine to reject the proposed change to Section 63.657(e) and therefore not impose a requirement for existing DCUs utilizing water overflow to install a disengaging/separator drum to achieve insignificant additional emission reductions. However, to the extent that EPA nonetheless determines to impose such additional requirement at this extremely late date, EPA must act in accordance with the authority granted under Section 112(i)(3)(A) and afford three years after the effective date of the revised standard for existing sources to achieve compliance with the new requirement.

Conclusion

For the reasons detailed above, PBF opposes EPA's proposal to amend the requirements of Section 63.657 by imposing new substantive obligations applicable to the operation of DCUs with the water over method. The proposal does not reflect any detailed analysis, is based upon incomplete and inaccurate information and is contrary to EPA's analysis of the MACT floor for these source operations. Implementation of the proposed change would not accomplish any material reduction in benzene or other HAP emissions, but would impose significant capital and operational burdens on operators of those existing DCUs that are not currently equipped with disengaging/separator drums but are operated with the water over method.

In addition, if the Agency nonetheless finalizes the proposed rule change and imposes this new substantive control obligation, it would be impossible for existing sources requiring configuration changes to achieve compliance with the new requirement by the currently applicable regulatory compliance date. Therefore, EPA must act consistent with the applicable statutory authorization and intent and provide three years from the effective date of any rule change for affected sources to demonstrate compliance.

We appreciate the opportunity to provide these comments concerning the Agency's proposed revisions to the RSR relating to operation of DCUs. If you should have any questions concerning these comments, please contact Richard Roat at (856) 224-6430.

Very truly yours,

A handwritten signature in black ink, appearing to read 'Heather Chelpaty', with a large, stylized loop at the end.

Heather Chelpaty
Vice President Health, Safety, and Environmental
PBF Energy

cc: Brenda Shine – EPA OAQPS
Richard Roat - PBF

References

¹National Emission Standards for Hazardous Air Pollutants from Petroleum Refineries. Background Information for Final Amendments. Summary of Public Comments and Responses. September 2015.

²Benzene Occupational Monitoring at the Paulsboro Refining Company LLC Delayed Coker.

³Memorandum from Jeff Coburn, RTI International to Brenda Shine, EPA/OAQPS/SPPD. Docket ID No. EPA-HQ-OAR-2010-0682. January 26, 2012; revised September 12, 2013.

⁴Technical Memorandum from Eric Goehl, Environmental Protection Specialist to Brenda Shine, EPA/OAQPS/SPPD. Summary of Delayed Coking Unit Emission Source Test Reports. October 15, 2012.

⁵EPA-453/R-94-080A. Air Emission Models for Waste and Wastewater. U.S. EPA Contract No. 68D10118 November 1994

⁶Over-flow water grab sample from operating DCU, collected on February 15, 2017.

⁷See generally, *Gasoline Distribution Bulk Terminals, Bulk Plants and Pipeline Facilities*, 40 CFR Part 63, Subpart BBBB, August 2008 (Revised January 2011), and at Section 63.11086.

⁸Current cost estimates to meet the proposed language is an additional \$5 to \$10 million dollars per DCU to the current project cost for water over into open top tanks (which range from \$3 to \$6 million dollars per DCU).

The Degassing Drum Requirement Proposed in the Refinery Sector Rule (RSR) Amendments Rule Represents Significant Cost with No Proven Benefit

In the final Refinery Sector Rule (RSR), EPA emphasized companies could use a few different methods to comply with the new Delayed Coker Unit (DCU) requirements: depressurizing coke drums to 2 pounds per square inch gauge (psig) before opening the drum for venting or use a “water-over” compliance method, whereby the coke drum is filled with water, which is continuously pumped into the drum and transferred through a blowdown system to a storage vessel until the coke drum is below 220 degrees F and can be opened. Despite highlighting the benefits of water over in the final refinery sector rule, the proposed RSR amendments would unnecessarily require the installation of a “degassing” or “disengaging” drum for cokers using the water-over method. Contrary to some NGO claims, this additional requirement would add significant cost, without any appreciable environmental benefits. Additionally, if this proposed requirement is promulgated, facilities would need at least three years to be able to install this new equipment.

Question: Without a degassing drum, is there a great risk that entrained gases would be emitted into the air when the coke drum is eventually opened after the water-over process cools the drum to below 220 degrees F?

Answer: Given the design of water-over DCUs, there is minimal to no risk of entrained gas emissions to the environment. In fact, the water-over process will still result in an emission rate lower than that projected under alternative compliance with the 2 psig requirement.

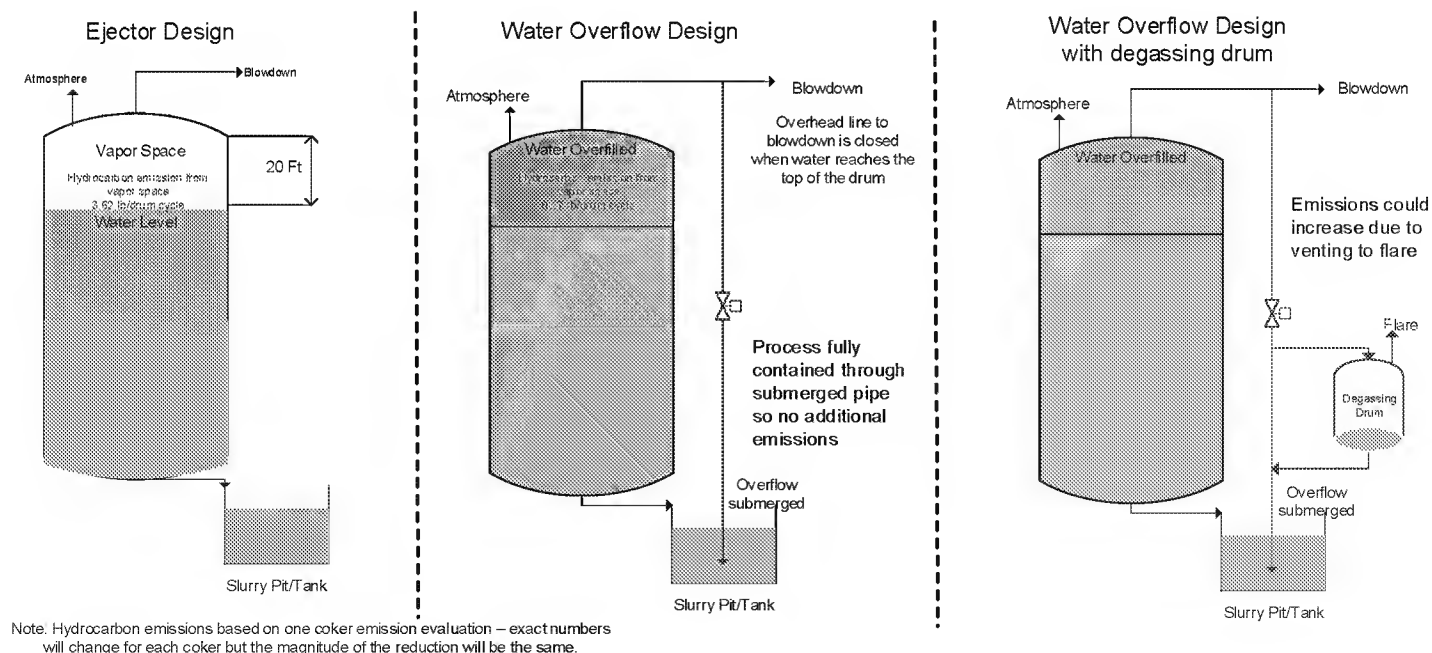
- The MACT requirement assesses potential emissions based on potential steam related vapor emitted when the coke drum is opened. Without water over, whenever the drum is opened, there is approximately 20 feet of vapor space that will be exposed to the environment.
- With water-over, the water fills this entire vapor space in the coke drum and reduces all steam related vapor potential via temperature reduction in the drum itself. Additionally, since the water from the drum is hard piped to a storage tank that contains quenching water via submerged fill, there is additional temperature reduction that further reduces the risk of any steam generation and, thus, steam related vapor emission from the storage tank.
 - Based on the reduction in vapor space volume, the reduction in this vapor space resulting from the water over method decreases the emissions by about 95%. See diagram below.
 - This analysis is consistent with EPA’s conclusion that the overhead temperature of 220°F using water overflow would achieve equivalent or greater emission reductions than the 2 psig pressure limitation stated in the rule.
- As a result, any potential hazardous air pollutants (HAPs) are comingled in a cool liquid, and are not available for emission to the atmosphere either when the coke drum is opened or via the water in the storage tank.
- Additionally, when the drum is full of water during the water over process, the blowdown system is closed off to prevent backflow of gases into the coke drum, which ensures that gases in the drum are quenched into liquid.
 - Gases in the blowdown system are already collected in a flare gas recovery system and, thus, prevented from being released into the environment.
- The addition of the degassing drum has the potential for higher emissions (related to flare combustion), since the drum will need to be connected to the flare system rather than going in a submerged fill tank with additional cooling.
 - Actual EPA test data on DCU vents indicated >99% composition of methane, ethane and hydrogen sulfide which are not regulated HAPS. The chemistry of the hydrogen sulfide will keep it dissolved in the water.

Question: If EPA promulgates a final rule imposing new requirements related to the “water over” compliance methods for delayed coking units, does EPA have the authority to establish a compliance date for such new requirements that is three years after the effective date of the modified RSR standard, in light of the Court’s prior decision in the “Plywood MACT” case?

Answer: If EPA modifies the RSR requirements for delayed cokers by imposing new emission control requirements on any source using the “water over” compliance method, the Court’s 2007 decision in *NRDC v. EPA*, No. 04-1323 (D.C. Cir. June 19, 2007) would not limit EPA’s authority to establish a three year compliance schedule running from the date of the new standards. *NRDC v. EPA* addressed challenges to the “Plywood MACT” regulations promulgated by EPA. Among the challenges raised by *NRDC* and *Sierra Club* was the argument that EPA had inappropriately extended, by one year, the compliance deadline for certain requirements, resulting in an ultimate compliance deadline of four years after the effective date of the original rule. EPA had justified its postponement of the compliance deadline on the basis that it had made “substantial” changes to the original rule.

The Court granted the *NRDC* challenge. However, the relevant changes to the “Plywood MACT” regulations constituted certain definitional changes and revisions to emission testing requirements, but not to any substantive obligations imposed under the Plywood MACT. In fact, in deciding the “Plywood MACT” case, the Court expressly determined, and relied for its decision upon the fact, that EPA had not changed the emission standards for affected sources since promulgation of the original rule. The Court specifically referenced the text of Section 112(i)(3)(A) of the statute, which provides that compliance must be achieved no later than three years after the effective date of “any emissions standard, limitation or regulation.” Because the Court found in the “Plywood MACT” case that EPA had not imposed any new emission standard or limitation in its subsequent regulatory action, the Court concluded that EPA did not have authority to establish a compliance deadline for the initial emission standard more than three years after the original effective date.

In the RSR case, EPA proposes to affirmatively change the emission standard for DCUs relying on the water over method, by imposing a new substantive obligation on affected sources relying on that compliance option. The fact that sources might have earlier elected a different compliance option does not change the analysis. Those sources that have been planning to rely upon the water over compliance option have not positioned their sources to timely comply with any other compliance option for delayed cokers, because they had no reason to do so before EPA undertook to change the water over standards. If EPA now changes the emissions standard for the water over option, affected sources must now begin to take appropriate actions to achieve compliance with this new emission limitation, or with any of the other compliance options for delayed cokers. Because these source operators would only now be informed of the change in emission standards that necessitates multiple years for required design, engineering, construction and shakedown activity, this change to the water over compliance option for delayed cokers is precisely the type of circumstance for which Section 112 authorizes EPA to grant three years from the effective date of the new standard to comply with this revised “emission standard or limitation.” The Plywood MACT case does not apply to these facts.



Message

From: Julia Rege [JRege@globalautomakers.org]
Sent: 10/16/2018 8:53:58 PM
To: Rakosnik, Delaney [rakosnik.delaney@epa.gov]; Lewis, Josh [Lewis.Josh@epa.gov]; Atkinson, Emily [Atkinson.Emily@epa.gov]
CC: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Charles Haake [chaake@globalautomakers.org]; Michelle Hernandez [mhernandez@globalautomakers.org]
Subject: RE: Request Mtg with Wehrum

Delaney,

Thank you. We will take the 10:45 AM time slot on the 22nd please. I will get back to you tomorrow to confirm participant names from our office.

Best, Julia
 202.650.5559

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From: Rakosnik, Delaney <rakosnik.delaney@epa.gov>
Sent: Tuesday, October 16, 2018 12:53 PM
To: Julia Rege <JRege@globalautomakers.org>; Lewis, Josh <Lewis.Josh@epa.gov>; Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>; Charles Haake <chaake@globalautomakers.org>; Michelle Hernandez <mhernandez@globalautomakers.org>
Subject: RE: Request Mtg with Wehrum

Hi Julia,

Bill Wehrum's calendar can accommodate a meeting on 10/22 at 10:45am. How does that work for your calendars?

Many thanks,

Delaney Rakosnik
 Staff Assistant
 Immediate Office of the Assistant Administrator
 Office of Air and Radiation, USEPA
 Room 5406A, 1200 Pennsylvania Avenue NW
 Washington, DC 20460
 Voice: 202-564-0935
 Email: rakosnik.delaney@epa.gov

From: Julia Rege [<mailto:JRege@globalautomakers.org>]
Sent: Friday, October 12, 2018 10:45 AM
To: Lewis, Josh <Lewis.Josh@epa.gov>; Rakosnik, Delaney <rakosnik.delaney@epa.gov>; Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>; Charles Haake <chaake@globalautomakers.org>; Michelle

Hernandez <rmhernandez@globalautomakers.org>

Subject: Request Mtg with Wehrum

Josh et. al.,

Global Automakers would like to request a meeting with Assistant Administrator Wehrum to discuss light-duty greenhouse gas regulations. If possible, we would like to have this meeting prior to the close of the proposed rule's comment period on October 26th, with preference for Oct 17 or Oct 22 in the AM. We can also provide other dates/time if these suggestions are not possible for the Assistant Administrator's availability.

Expected attendees include myself and Charles Haake, and potentially other Association staff depending on the selected date/time.

Best, Julia

Julia Rege
Director, Environment & Energy
Association of Global Automakers, Inc. (Global Automakers)
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GlobalAutomakers 



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Appointment

From: Szabo, Aaron L. EOP/CEQ [Aaron.L.Szabo@ceq.eop.gov]
Sent: 10/30/2018 4:36:26 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]

Subject: WH/EPA Meeting
Location: JP

Start: 11/2/2018 6:00:00 PM
End: 11/2/2018 7:00:00 PM
Show Time As: Tentative

Recurrence: (none)

Message

From: Baer, Louis [LBaer@cement.org]
Sent: 2/4/2019 3:28:38 PM
To: Woods, Clint [woods.clint@epa.gov]
CC: Franklin, Charles [CFranklin@cement.org]; Bohan, Richard [rbohan@cement.org]; Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; DeLuca, Isabel [DeLuca.Isabel@epa.gov]
Subject: RE: Invitation to Speak at IEEE Conference in St. Louis on May 1

Clint,

I wanted to follow up with you on PCA's invitation to speak at the IEEE conference in St. Louis on Wednesday, May 1. You had mentioned that it would potentially work for you to attend but that was before the shutdown. When you are able, please let me know if you are able to attend. We hope you have the opportunity to speak during the conference. We look forward to hearing from you.

Best,
Louis

Louis A. Baer, Esq., CPEA
Director/Assistant Counsel, Government Affairs
Portland Cement Association
1150 Connecticut Avenue NW, Suite 500
Washington, DC 20036
Office: 202-719-1981
Cell: 314-922-8041
lbaer@cement.org
www.cement.org

From: Baer, Louis
Sent: Friday, December 21, 2018 5:22 PM
To: Woods, Clint <woods.clint@epa.gov>
Cc: Franklin, Charles <CFranklin@cement.org>; Bohan, Richard <rbohan@cement.org>; Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>; DeLuca, Isabel <DeLuca.Isabel@epa.gov>
Subject: Re: Invitation to Speak at IEEE Conference in St. Louis on May 1

Clint,

That's excellent news! We will coordinate with you after the new year. Merry Christmas and a Happy New Year to you as well.

Best,
Louis

Sent from my Verizon, Samsung Galaxy smartphone

----- Original message -----

From: "Woods, Clint" <woods.clint@epa.gov>

Date: 12/21/18 4:26 PM (GMT-05:00)

To: "Baer, Louis" <LBaer@cement.org>

Cc: "Franklin, Charles" <CFranklin@cement.org>, "Bohan, Richard" <rbohan@cement.org>, "Gunasekara, Mandy" <Gunasekara.Mandy@epa.gov>, "DeLuca, Isabel" <DeLuca.Isabel@epa.gov>

Subject: Re: Invitation to Speak at IEEE Conference in St. Louis on May 1

Louis,

Sorry for my delay, and thanks so much for the invitation! Let me run a couple traps and get back to you in early January, but I think we should be able to make this work.

Merry Christmas!

Clint

On Dec 18, 2018, at 4:07 PM, Baer, Louis <LBaer@cement.org> wrote:

Clint,

Thank you again for speaking with me during the ABA Conference in San Diego and attending the meeting with Acting Administrator Wheeler on NHSM issues. We welcome the feedback from EPA and hope to follow up with the Office of Land & Emergency Management quickly and will keep you, Mandy, and David informed as we move forward.

PCA would like to formally invite you to speak during the PCA-sponsored morning session of the Institute of Electrical and Electronics Engineers (IEEE) Conference in St. Louis, MO on Wednesday, May 1. With your technical background, you would be a great speaker to address the technical audience within the cement industry on EPA's regulatory reform efforts in the Office of Air & Radiation. The IEEE is the largest conference in the cement industry and will include presentations of the latest technology covering a variety of topics important to the industry. Attendees at the conference include PCA member company CEOs, senior member company environmental representatives, and member company technical staff.

If you have time to stay in St. Louis, on Thursday, May 2, conference attendees will be visiting the LafargeHolcim Ste. Genevieve plant south of St. Louis, which is the largest cement producing plant in the U.S. producing 4 million tons of cement annually.

Please let us know if you are able to attend and speak on May 1. Thank you very much! We look forward to hearing from you. Have a Merry Christmas and Happy New Year.

Best,
Louis

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<PCA Invite for Woods__IEEE_12182018.pdf>

Message

From: Pagano (US), Peter A [peter.a.pagano@boeing.com]
Sent: 10/24/2018 2:14:36 PM
To: Harlow, David [harlow.david@epa.gov]
CC: Lewis, Josh [Lewis.Josh@epa.gov]; Atkinson, Emily [Atkinson.Emily@epa.gov]; Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Rogers (US), Steven [Steven.Rogers@boeing.com]
Subject: RE: Background Document for tomorrow's meeting - Comments on Draft NSR Guidance
Attachments: NEDACAP Comment on Draft Interpreting Adjacent in All Industries Other Than Oil and Gas.pdf

David

Good to meet you last nite. As discussed, just wanted to send along the coalition comments on the draft guidance which we will refer to in our meeting tomorrow. The key point is in section (f) on page 5. See you tomorrow.

All the best,
 Peter A. Pagano
 Director, Environment
 The Boeing Company
 703-414-6486
 Email: peter.a.pagano@boeing.com

From: Harlow, David [mailto:harlow.david@epa.gov]
Sent: Tuesday, October 16, 2018 5:24 PM
To: Pagano (US), Peter A <peter.a.pagano@boeing.com>
Cc: Lewis, Josh <Lewis.Josh@epa.gov>; Atkinson, Emily <Atkinson.Emily@epa.gov>; Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Subject: RE: Meeting Request - Draft NSR Guidance Document

Peter,

Yes, I would be delighted to meet with you and your colleague to discuss this issue. Of the three days you mentioned, either the 24th or the 25th would work well for me. My calendar for October 23rd is already a bit full. But either that Wednesday or Thursday should be fine.

If you would be so good as to reach out to Emily Atkinson, our Office Manager here in the OAR Immediate Office who, among her many duties, also keeps track of my calendar – e.g., scheduling such meeting, and making sure that the relevant people from our program office are invited to participate – I would appreciate it. She will be able to work with you to find a mutually agreeable time next week for us to meet.

Thank you.

David S. Harlow
 Senior Counsel
 Immediate Office of the Assistant Administrator
 Office of Air and Radiation, USEPA
 WJC-N Room 5409K

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Harlow.David@epa.gov

From: Pagano (US), Peter A [<mailto:peter.a.pagano@boeing.com>]
Sent: Tuesday, October 16, 2018 3:31 PM
To: Harlow, David <harlow.david@epa.gov>
Cc: Gunasekara, Mandy (EPW) <Mandy_Gunasekara@epw.senate.gov>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Meeting Request - Draft NSR Guidance Document

Hi David,

I was referred to you by Mandy regarding the Draft Guidance Memorandum: Interpreting “Adjacent” for New Source Review and Title V Source Determination in All Industries Other Than Oil and Gas. Boeing has worked with a number of coalition partners to provide comments to the FR notice. We would appreciate the opportunity to meet with you next week to review some of the comments to provide a context on how the final guidance document could affect Boeing’s future manufacturing operations. My colleague Steven Rogers and I would appreciate the opportunity to meet with you on either October 23, 24 or 25. Sorry for the short notice but next week Steven will be in DC from the west coast and we would like for him to be able to participate in person. Please let me know what may be convenient times for you on any of those days. Thank you in advance for your consideration of our request.

All the best,

Peter A. Pagano
Director, Environment
The Boeing Company
703-414-6486
Email: peter.a.pagano@boeing.com



The National Environmental Development Association's Clean Air Project

October 3, 2018

By Electronic Mail

Adjacency_Guidance@epa.gov

Raj Rao and Cheryl Vetter

EPA Office of Air Quality, Planning & Standards

104 T.W. Alexander Drive

Research Triangle Park, NC 27711

Attn: Nizich.greg@epa.gov.

Members:

The Boeing Company
BP America
Caterpillar, Inc.
Eli Lilly & Company
Georgia-Pacific LLC
Invista S.a.r.l.
Koch Industries, Inc.
Marathon Petroleum Company
Merck & Co., Inc.
Occidental Petroleum Corporation
Phillips 66
Procter & Gamble
Solar Turbines, Inc.
Counsel:
Ritts Law Group, PLLC

RE: "Interpreting 'Adjacent' for New Source Review and Title V Source Determinations in All Industries Other Than Oil and Gas"

Dear Sir or Madam:

Introduction and General Comments – The National Environmental Development Association's Clean Air Project ("NEDA/CAP") appreciates this opportunity to comment on draft guidance that clarifies that two or more sources are "adjacent" if they are physically proximate or "nearby" for purposes of determining if they are part of the same "stationary source," "major stationary source," or "major emitting facility" pursuant to the Clean Air Act. NEDA/CAP is a coalition of manufacturing industries that own and operate facilities across the United States. They are affected directly by EPA's definition of "major source," because its meaning is determinative of whether a source requires a CAA New Source Review and/or a Title-V permit to construct, expand, and operate its plant. NEDA/CAP agrees that this "interpretation" is needed because public confusion persists on the meaning of "adjacent" despite 2012 and 2014 federal court decisions that rejected EPA's definition of adjacent based on their "functional interrelationships" rather than proximity. *NEDA/CAP v. EPA*, 752 F.3d 999, 1009 (D.C. Cir. 2014) (*vacating EPA's 2013 "Summit Directive"*¹); *Summit Petroleum v. EPA*, 690 F.3d 733 (6th Cir. 2012) (*vacating EPA's finding that gas wells and a sweetening plant located as many as 30 miles from each other were "adjacent" and thus part of the same "major stationary source for purposes of applicability of Title V permitting*).

NEDA/CAP generally considers the September 4, 2018 "Draft Interpretation" to be legally consistent with EPA regulations, and to be consistent with the judicial directives to the agency to implement the definitions of a "major source" and "major emitting facility" to be consistent with a "common sense notion of a plant." *See* 45 FR 52676, 52694 (August 7, 1980)

¹ P. Tsirigotis, EPA OAQPS Director, "Applicability of the Summit Decision to EPA Title V and NSR Source Determinations" (Dec. 21, 2013)

(citing *Alabama Power Co. v. Costle*, 636 F.2d 323, 397 (D.C. Cir. 1979)).² NEDA/CAP concurs with the clear direction that EPA offers in the memorandum, including statements that the inclusion of criteria similar to “shared equipment” and “the existence of functional relationships such as a pipeline, railway or other dedicated conveyance like a transmission line should not be invoked to establish “adjacency.”

We suggest additional clarifications below, and urge EPA to finalize the Memorandum expeditiously. In particular, NEDA/CAP urges EPA to include as part of its definition of “adjacent” a distance between stationary sources that are commonly owned and operated, beyond which EPA would not generally expect to find that facilities are part of the same “major source,” just as it has done through regulations for the oil and gas industry.

A. Focusing Exclusively on Proximity in Applying the Term “Adjacent” Is Legally Required.

NEDA/CAP strongly supports the Draft Interpretation of “adjacent” as “physically proximate.” As NEDA/CAP argued in *NEDA/CAP, supra*, interpretation of the term “adjacent” in the definition of “stationary source” must be based legally on geographic proximity.³ Thus, we have argued that any interpretation of “adjacent” that is based on “functional interrelationships” is legally in error and unreasonable based on EPA’s regulations. Any definition of “adjacent” in the definition of “stationary source” also is inconsistent with the D.C. Circuit’s finding in *Alabama v. Costle*, 636 F.3d 323, that EPA may allow for aggregation only “where appropriate, of industrial activities according to considerations such as proximity and ownership.” *Id.* at 397. It is unreasonable for functional relationships of manufacturing facilities that are located miles apart to be considered part of the same plant, requiring them to be aggregated for purposes of Clean Air Act permit applicability just because they may produce intermediaries or parts for products assembled elsewhere. For similar reasons, EPA itself found in the 1980 NSR rulemaking, that--

To have merely added function to the proposed definition as another abstract factor would have reduced the predictability of aggregating activities under the definition dramatically, since any assessment of functional interrelationships would be highly subjective. To have merely added function would also have made administration of the definition substantially more difficult, since any attempt to assess these interrelationships would have embroiled the agency in numerous fine-grained analyses.

45 Fed. Reg. 52,676, 52695 (Aug. 7, 1980).

Moreover, there is no need to do further rulemaking to withdraw the prior erroneous and illegal agency interpretations of “adjacent,” since EPA has not in the past 48 years modified the regulatory definitions of a “major source” or “major emitting facility” that rejected a definition of “adjacent based on functional interrelationships. Instead, EPA adopted a definition of

² See Draft Interpretation at page 3, FN 11.

³ While the Court did not rule on its argument, as EPA notes in the Draft on page 3, NEDA/CAP is on record before the D.C. Circuit making the argument that Summit Directive, *supra* at 1, was not legally permissible.

“adjacent” that was based on geographic proximity and subsequently adopted the same definition from the 1980 PSD regulations in the definition of “major source” in the Title V regulations in 2002.⁴

B. EPA Should Withdraw All “Major Source” Determinations Based on “Findings of Functional Inter-relationships.”

EPA officials told NEDA/CAP members at a September 5, 2018 meeting at the Office of Air Quality Planning and Standards that the agency intends to retain on EPA’s website the numerous prior agency interpretations of “adjacent.” NEDA/CAP submits that to do so would be confusing to all stakeholders, including permit authorities, permit applicants, and the public. The agency should retain only those determinations that are consistent with this Final Interpretation that concern permit decisions related to the physical proximity of sources. Also, since NEDA/CAP argues below that there is a predicate for defining adjacent with reference to a bright line distance, interpretations of “adjacent” that are based on distances no longer consistent with the finalized interpretation also should be withdrawn. If EPA intends to maintain archival copies of historic interpretations of the term “adjacent,” these interpretations should be clearly notated or watermarked as having been “superseded” by this interpretation when it is finalized.

C. EPA Should Not Invite Permit Authorities to Consider Factors Other than Physical Proximity.

In the Draft Memorandum’s concluding paragraph, EPA says that “States with approved NSR and Title V programs remain responsible for determining in the first instance whether in their discretion specific facilities are adjacent. They are not required to apply the interpretation set forth in this memorandum.”⁵ Similarly, on the next to the last page, EPA states that “permitting authorities will still be responsible for making case-specific determinations, taking account of the facts and circumstances.”⁶ NEDA/CAP objects to these statements as being inconsistent with the Clean Air Act.

First, EPA should not condone in any manner unlawful interpretations of the word “adjacent,” for the reasons stated above. To do so would be inconsistent with legal precedent and unreasonable given the confusion that have plainly inconsistent definitions of the term would continue to introduce into Clean Air Act permitting. Second, nearly all State New Source Review programs, whether delegated or SIP-approved, utilize EPA regulations defining “stationary source” or “source” for purposes of aggregating emissions activities for applicability of “major source thresholds” verbatim, so there is no legal basis for EPA-approved State programs to use a different definition of “adjacent,” just because they are SIP-approved rather than delegated air permit programs. (Moreover, in the case of Title-V programs, EPA’s approval of State programs is not SIP-based. All Title V programs must be consistent with the federal program, even if lower T-V applicability thresholds apply.) Third, the Draft Memorandum’s conclusion that States need not apply EPA’s interpretation is bad public policy. It is an invitation that could lead to non-consistent “major source” determinations across the county,

⁴ See Draft, page 4.

⁵ See Draft, page 8.

⁶ Draft, page 7.

sowing confusion and leading to an uneven playing field for industry and the public. Therefore, EPA must advise Regional Offices reviewing final permit decisions that case-by-case determinations should be consistent with this EPA interpretation, and their applicability to adjacent activities thoroughly explained, to avoid permitting confusion and legal inconsistency. NEDA/CAP urges EPA to re-examine and remove these statements allowing permitting inconsistency between States on the application of the term “adjacent.”

D. NEDA/CAP Disagrees that this Interpretation Should Be Applied Only Going Forward.

The Draft Interpretation argues that it would be wasteful and confusing for EPA to apply the “Final Interpretation” retroactively to plants and other emitting equipment that are already permitted, even if that would be legally preferable. NEDA/CAP disagrees, again because we believe that there *was* no legal justification for prior aggregations of sources that were not physically PROXIMATE under a legally deficient interpretation of the term “adjacent.” Therefore, for sources that have received Title V or NSR permits based on misapplication of that term, owners and operators of affected sources should be able to request permitting authorities to “dis-aggregate” emitting activities that were improperly combined because of “functional interrelationships.” In some cases, improper aggregation of sources can stifle growth and improperly impose additional costs of New Source Review and permitting on owners and operators of affected facilities in the future. Therefore, the Final Interpretation should state that it is permissible for owners and operators of regulated Title V- and NSR-affected permits to request that they be disaggregated and that such actions should be compelled on the part of all permit authorities.

In addition, NEDA/CAP urges EPA to include a precaution in the Final Interpretation that where sources were once aggregated based on their proximity, but are no longer under common ownership or control, they too should be “dis-aggregated” under most circumstances, especially if factual criteria analyzed in EPA’s Meadowbrook Energy and Keystone Landfill Common Control Analysis (Apr. 30, 2018) determination are applicable.

E. The Final Interpretation Should Allow Sources That Generated Netting Credit to Be Separated Under Most Situations.

NEDA/CAP also disagrees with EPA’s position that if two or more facilities were aggregated improperly under the functional interrelationship definition of “adjacent,” and they thereafter relied on that interpretation in a contemporaneous netting analysis, then the operations should continue to be considered one source provided the common control and same industrial grouping criteria continue to apply. There is no legal basis for disallowing a proper re-classification of a source as two separate non-adjacent sources on the basis that the two sources, that were improperly aggregated under prior EPA policy, were involved in a prior contemporaneous netting analysis. A future re-classification as two separate sources changes nothing about a prior NSR project, assuming proper netting occurred when the activities were classified as a single source. Any emission limitations set during the contemporaneous netting exercise would continue to apply unless modified through subsequent permitting actions. The only caveat, in NEDA/CAP’s view, would be that any *future* netting analysis should not rely on

any “contemporaneous” emission reductions that were relied upon for any prior emission increases. For this reason, NEDA/CAP recommends that the final guidance should not include the current draft’s restriction on the ability to correct the source classification if the source was previously involved in a contemporaneous netting analysis.⁷

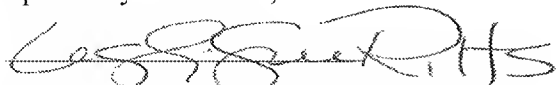
In addition, the Final Interpretation should be caveated to prohibit any party including EPA or a State or Citizen, from attempting to enforce retroactively a netting determination that came about based on application of EPA’s unlawful interpretation of “adjacent.”

F. EPA Should Reconsider and Provide in the Final Memorandum a Bright Line Definition of “Adjacent.”

Because case-by-case decision making slows NSR permitting and puts those businesses seeking permits for time-sensitive projects in a highly coercive “negotiating” environment, NEDA/CAP asks the Agency to reconsider its current stance rejecting a bright-line test for determining when sources are adjacent, based on the distance between source fence-lines. Based on the reasoning for oil and gas wells presented in the rulemaking establishing the regulatory definition of “adjacent” for the oil and gas industry, EPA should apply the same reasoning here and establish a bright-line determination that “in no case should a permitting authority find that two parcels separated by more than a quarter of a mile is adjacent.” Alternatively, the Agency should, based on the same legal predicate, include in its Final Interpretation that “although this Interpretation does not set a bright line distance for determining adjacency, EPA feels that it would be extremely rare for a permitting authority to encounter a situation where a separation greater than a quarter of a mile would support a finding that two parcels are adjacent.” Neither solution would in NEDA/CAP’s view require a regulatory action based on the prior rulemaking for the oil and gas industry, which we believe represented more complex facts and was not challenged before the D.C. Circuit.

Conclusion – NEDA/CAP reiterates its strong view that this Interpretation is needed. There continues to be confusion among stakeholders on when aggregation of sources for CAA permitting should occur, based on historic EPA definitions of “adjacent” based on functional interrelationships of various types of commonly owned equipment and facilities. Therefore, NEDA/CAP urges the agency to make the proposed changes to the interpretation that we have requested and to issue the Draft Memorandum in final form as soon as possible to ease permitting confusion and related resource burdens for our members and other interested stakeholders. If you have questions or want to discuss these comments further, we would be delighted. Please contact me at 703.823.2292 or LRitts@rittslawgroup.com.

Respectfully submitted,



Leslie Sue Ritts, Counsel to NEDA/CAP

⁷ NEDA/CAP believes that a similar analysis would apply to emission reductions included in Step 1 Project Emissions Accounting.

**NEDA/CAP Comments on “Interpreting “Adjacent” for New Source Review and Title V
Source Determinations in All Industries Other Than Oil and Gas”**
October 3, 2018.

Cc: David Harlow, Office of Air & Radiation General Counsel & Deputy Assistant Administrator

Message

From: Chris Tomassi [tomassi@clearpathaction.org]
Sent: 11/1/2018 7:53:01 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
CC: Zak Baig [baig@clearpathaction.org]
Subject: Thanks and follow ups
Attachments: Draft IRS Section 5 Guidance.docx

Hi Mandy - Thank you so much for taking the time yesterday to chat. We really appreciate your willingness to engage on this issue and hope that we can be a resource as IRS works with EPA to implement the new 45Q credit.

As promised, I've attached the draft guidance from the informal Energy Advance Center, which we shared in paper form yesterday. I sent it to Mark on a separate email, so he has an electronic copy as well.

You had also asked for a suggestion about who you could touch base with at IRS, which would be really helpful in ensuring that IRS actually consults with EPA as the law requires. IRS does not have a large number of political appointees, but we are told that Brad Bailey and Justin Sok are the politicals who are focused on tax implementation. Their contact info is below.

Lastly, we really appreciate the heads up about the potential for ClearPath to be at the side event with you in Poland. If our Executive Director Rich Powell does end up being invited to participate, let us know if you'd like us to bring him by so that you all can get acquainted before you get the pleasure of spending December in Poland.

Hope Halloween was fun and that your research yielded a stellar deer face.

Thanks again!
Chris

Brad Bailey
U.S. Department of Treasury
Acting Assistant Secretary for Legislative Affairs
bradley.bailey@treasury.gov

Justin Sok
U.S. Department of Treasury
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SECTION 5. SECURE GEOLOGICAL STORAGE

.01 In General.

(a) Introduction. In order to qualify for the § 45Q credit, a taxpayer must either physically or contractually ensure the disposal or use as a tertiary injectant of the qualified captured CO₂ in secure geological storage using adequate security measures as specified by the Secretary in regulations. See §§ 45Q(f)(2) and 45Q(f)(3)(A). Utilization under §45Q is not addressed in this Notice. The term “secure geological storage” includes storage in deep saline formations, oil and gas reservoirs, unminable coal seams, and other geologic formations under such conditions as the Secretary may determine under regulations. There are not yet regulations setting forth the requirements for secure geological storage under §45Q. This section of the notice provides interim procedures for a taxpayer to determine adequate security measures for the secure geological storage of CO₂ until such regulations are promulgated. In the event that a taxpayer contractually disposes of or uses the qualified CO₂ as a tertiary injectant, the taxpayer must provide documentation indicating compliance by the contracting company as required under section 7 of this notice. A taxpayer that meets the requirements of section 5.02 of this notice is deemed to have demonstrated secure geological storage for purposes of the § 45Q credit.

(b) Notice 2009-83 and subsequent regulatory changes. This Notice amends and revises Notice 2009-83 (issued in November of 2009) to reflect a variety of subsequent regulatory changes. The 2009 Notice directed taxpayers to follow the Environmental Protection Agency’s (EPA) Underground Injection Control (UIC) program, (40 C.F.R. parts 144 through 148) that employed a multiple barrier approach for fluid injection wells that included requirements for the geologic siting, construction, operation, testing, and closure of injection wells to ensure that injected fluids remain isolated from underground sources of drinking water (USDWs) and the environment. These regulations included Class II well requirements governing the injection of carbon dioxide (among various other fluids) in enhanced recovery wells associated with oil and gas production (40 C.F.R. §§146.21-146.24). At the time the 2009 Notice was issued, EPA was revising its

[PAGE]

UIC program to create a new well class for geologic sequestration of CO₂. It also was adding to its recently issued Final Mandatory Greenhouse Gas Reporting Rule (Reporting Rule), which required that certain CO₂ sources to monitor and report. In December 2010, EPA added reporting requirements for injections for dedicated geologic storage of CO₂ (Reporting Rule Subpart RR) and for tertiary recovery of hydrocarbons (Reporting Rule Subpart UU).

(c) Changes to EPA's Underground Control Program. The 2009 Notice provided that once the EPA's new UIC program well class rule was finalized, "any taxpayer claiming the § 45Q credit who is covered by the new program rules must follow the modeling, monitoring, well construction, and other requirements of the relevant permit as required under the rules". The new program rules were codified as Class VI of the UIC program, expanding the regulatory framework for well injections of carbon dioxide as well as reporting of carbon dioxide emissions and sources under its Greenhouse Gas Reporting rules. The UIC program now separately addresses injections of carbon dioxide under UIC Class VI permitting where the carbon dioxide is injected for the purpose of dedicated long-term storage, and under UIC Class II permitting where the carbon dioxide is injected for the purpose of enhanced oil or natural gas recovery and where geologic storage of the carbon dioxide occurs in association with the hydrocarbon recovery process.

Each set of UIC well permitting regulations is adapted to the activity being regulated. EPA has determined that compliance with its rules ensures secure geologic storage of the injected carbon dioxide in both types of operations. With regard to UIC Class II wells, EPA stated: "CO₂ storage associated with Class II wells is a common occurrence, and CO₂ can be safely stored where injected through Class II-permitted wells for the purpose of enhanced oil or gas-related recovery." Memorandum to Regional Water Division Directors, Peter C. Grevatt, Director, Office of Ground Water and Drinking Water, April 23, 2015.

With regard to Class VI wells, EPA adopted the new well permitting class in recognition of "unique risks" associated with such operations, principally including the pressure

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increases in the subsurface expected to result from such operations. 75 Fed. Reg. at 77234. The new Class VI rules have been codified at 40 C.F.R. §§ 146.81 to 146.95.

EPA has determined that the "[u]se of anthropogenic CO₂ in [enhanced oil recovery] operations does not necessitate a Class VI permit" and that "Class VI site closure requirements are not required for Class II CO₂ injection operations." Grevatt memorandum. The basis for EPA's determination is that regulation under the Class II program includes requirements for secure operations, including requirements for prior site characterization, area of review, well construction (e.g., casing and cementing), well operation (e.g., injection pressure), injectate sampling, mechanical integrity testing, plugging and abandonment, financial responsibility, and reporting. 80 Fed. Reg. 64510, at 64588.

d. Changes to Reporting Rule. On October 30, 2009, EPA began adopting rules requiring the reporting of the emission of certain greenhouse gases (including carbon dioxide). 74 Fed. Reg. 56260 (October 30, 2009). The initial reporting rule was expanded and refined in subsequent years. Following these changes, source categories relevant to accounting for secure geological storage of CO₂ that are subject to greenhouse gas emission reporting now include the following:

- Subpart C – Emissions from General Stationary Fuel Combustion Sources. Originally adopted at 74 Fed. Reg. 56260 (October 30, 2009) (citation with subsequent amendments at <https://www.epa.gov/ghgreporting/subpart-c-general-stationary-fuel-combustion-sources>),
- Subpart W – Emissions from Petroleum and Natural Gas Systems. Originally adopted at 75 Fed. Reg. 74,458 (November 30, 2010) (citation with subsequent amendments at <https://www.epa.gov/ghgreporting/subpart-w-rulemaking-resources>). Subpart W includes onshore and offshore oil and natural gas production and onshore petroleum and natural gas gathering, among other related activities;

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- Subpart PP – Suppliers of Carbon Dioxide. Originally adopted at 74 Fed. Reg. 56260 (October 30, 2009) ((citation with subsequent amendments at <https://www.epa.gov/ghgreporting/subpart-pp-suppliers-carbon-dioxide>;
- Subpart RR – Geologic Sequestration of Carbon Dioxide. Originally adopted at 75 Fed. Reg. 75060 (December 1, 2010) (citation with subsequent amendments at <https://www.epa.gov/ghgreporting/subpart-rr-geologic-sequestration-carbon-dioxide>). The source category includes any well or group of wells that inject a CO₂ stream for long-term containment in subsurface geologic formations, but does not include any well or group of wells where a CO₂ stream is being injected in subsurface geologic formations to enhance the recovery of oil or natural gas unless either (a) the owner or operator has chosen to submit a proposed monitoring reporting and verification plan to EPA and received an approved plan from the EPA; or (b) the injection well is permitted under UIC Class VI. 40 C.F.R. § 98.440;
- Subpart UU — Injection of Carbon Dioxide. Originally adopted at 75 Fed. Reg. 75060 (December 1, 2010). EPA's chart listing subsequent rule amendments is found at <https://www.epa.gov/ghgreporting/subpart-uu-injection-carbon-dioxide>. The source category includes any well or group of wells that inject a CO₂ stream into the subsurface. Injections reported under Subpart RR need not be reported under Subpart UU. A facility that is subject to this part only because it is subject to subpart UU of this part is not required to report emissions under subpart C of this part or any other subpart listed in § 98.2(a)(1) or (a)(2). 40 C.F.R. § 98.470.

The reporting rules combine with the UIC well permitting rules to create a comprehensive framework that provides parallel and equivalent paths for determining adequate security measures for secure geologic storage that are tailored for geologic storage associated with Class II EOR operations as well as higher pressure/higher volume Class VI geologic storage of CO₂ in deep saline, unminable coal seams, or depleted, non-producing oil or gas formations. In addition, the Reporting Rule's applicability to the use of anthropogenic CO₂ in oil and gas operations creates a series of defined inputs at each point in the chain from original CO₂ supply (Subpart PP) to

surface emissions from the production-related equipment (Subpart W), emissions from related stationary combustion sources (Subpart C), to the quantities injected into the hydrocarbon formation (Subpart UU). As detailed below, compliance with the relevant ***UIC permitting regulations*** (i.e. Class II for associated storage incidental to enhanced oil recovery or Class VI for dedicated storage in deep saline aquifers) assures secure containment of the injected CO₂ while compliance with the applicable ***Reporting Rule requirements*** (Subpart RR for Class VI or Subparts C, W, PP, and UU for Class II operations) creates a documented, traceable chain across the transactions from the original capture source to the site of CO₂ geologic disposition or use.

.02 Requirements of Secure Geological Storage.

(a) Measurement of CO₂ at the Source of Capture. A taxpayer claiming the § 45Q credit must use the methodology, inputs, and equations in the Reporting Rule identified above (or any successor rule) to calculate the amount of CO₂ measured at the source of capture. The amount reported under the applicable reporting rule must be consistent with the amount of qualified CO₂ taken into account for purposes of the § 45Q credit.

(b) Sequestration Site Rules.

(i) Documentation downstream of point of capture. A taxpayer claiming the § 45Q credit must document emissions downstream of the point of capture or make available documentation from the relevant third-party operator. Such documentation must show that the operators of facilities receiving the captured CO₂ have followed and applied the modeling, monitoring, well construction, and other requirements of the relevant UIC permit as required under the rules, and the applicable Reporting Rule subparts related to the captured CO₂, including subparts C, W, PP, RR and UU, as applicable.

(ii) Site Closure. Once CO₂ injections cease, the operator shall comply with regulatory requirements for the UIC well class permit in question (whether Class II or Class VI), which shall include plugging and abandonment of wells and site closure, including cementing of all production and injection wells and following plugging and abandonment specifications and bonding requirements. A licensed professional engineer shall certify the operator has complied with the permit representations and

[PAGE]

conditions set by the state. For Class VI storage, the operator shall comply with requirements of the applicable EPA-approved Subpart RR MRV plan.

03. Secure geologic storage (SGS). For Class II wells, Subpart UU, together with the emission and source documentation and reporting requirements of Subparts PP, W, and C, together with applicable Class II UIC permitting and site closure requirements, constitute “adequate security measures for the geologic storage of carbon dioxide” for the purposes of Section 45Q. Subpart RR, including an MRV plan to ensure proper site closure, together with the requirements of Class VI permitting applicable to dedicated geologic sequestration, provide “adequate security measures for the geologic storage of carbon dioxide” to meet the requirements of 45Q.

Message

From: Matthew Forman [matthew.forman@fcagroup.com]
Sent: 10/26/2018 7:20:49 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: FCA's comments on CAFE/GHG NPRM
Attachments: FCA_Comments_for_CAFE-GHG_NPRM_Final_Exec Summary.pdf

Mandy,

Attached is the Executive Summary of FCA's comments on the SAFE proposed rule that were filed this afternoon. As reflected in the attached, our position has been consistent from day one. FCA supports continued improvements in fuel economy from today's levels, and we remain supportive of preserving One National Program. But the standards need to be based on market realities as they have evolved since 2012. The misalignment between market realities and key assumptions underlying the current standards, such as electrification adoption rates, fuel prices, and consumer preferences for UVs, has resulted in an industry-wide compliance hole that will continue to expand over time. As a result, the footprint-based standards for model years 2021-2026 must be adjusted to bridge the compliance gap.

Please let me know if you have any questions.

Best,
Matt Forman
FCA US LLC
Office: 202.414.6707
Cell: 202.578.5249



October 26, 2018

To: U.S. Environmental Protection Agency
 EPA Docket Center
 Air and Radiation Docket
 Mail Code 28221T
 1200 Pennsylvania Avenue NW.
 Washington, DC 20460

U.S. Department of Transportation
 Docket Management Facility,
 M-30 West Building
 Ground Floor, Rm. W12-140
 1200 New Jersey Ave SE
 Washington, DC 20590

****** PUBLIC VERSION ******

**Re: FCA Comments on The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule
 for Model Years 2021–2026 Passenger Cars and Light Trucks Notice of Proposed Rulemaking**

Docket ID Numbers: EPA-HQ-OAR-2018-0283; NHTSA-2018-0067
 VIA Regulations.gov <http://www.regulations.gov>

FCA US LLC (FCA) respectfully submits the following comments in response to the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021–2026 Passenger Cars and Light Trucks Notice of Proposed Rulemaking (NPRM).¹ Supporting information and additional detail are provided in the attached Appendices, which contain FCA Confidential Business Information (CBI). FCA also helped compile and supports the comments submitted by the Alliance of Automobile Manufacturers (the Alliance).

Introduction

FCA is a North American automaker based in Auburn Hills, Michigan. It designs, manufactures, and sells or distributes vehicles under the Chrysler, Dodge, Jeep®, Ram, FIAT and Alfa Romeo brands. In 2017, FCA sold over 2 million vehicles in the U.S. FCA employs more than 62,000 individuals in the U.S., and since 2009, the Company has created more than 30,000 jobs and invested more than \$10 billion in the U.S. Improving the fuel economy and greenhouse gas emissions of our products is important to FCA, our customers, U.S. energy security and the environment.

FCA supports continued improvement in fuel economy from today's levels, and we are investing billions of dollars in fuel saving technologies across our product lineup. Some highlights at FCA include: our new family of downsized and boosted direct injection engines, implementation of wide-ratio 8 and 9 speed transmissions, the class leading Pacifica Plug-in Hybrid Electric Minivan, the battery electric Fiat F500e, the introduction of eTorque 48V mild hybrid technology on V6 and V8 Ram pickups, the application of stop-start technology across multiple products, and our announcement of a Plug-in Hybrid Electric Jeep Wrangler.

¹ 83 Fed. Reg. 42986 (Aug. 24, 2018).

Current Market is Different than 2012 Assumptions

The automotive market today is different from what we – regulators and industry, alike – predicted it would be in 2012. Unanticipated shifts in gas prices, consumer preferences and the lack of penetration of alternative fuel technologies are the primary reasons that in MY2016 the industry as a whole failed to meet fleet-wide fuel economy standards for the first time without using credits earned in previous years – and is projected to fall further behind in the coming years. The final rule must be based on the market realities of today and provide a pathway to compliance on that basis.

In the original regulation establishing standards for MY2017–2025 greenhouse gas emissions and fuel economy, gas prices were predicted to be over \$4 per gallon by 2018, while today's actual prices are under \$3 per gallon. For the NPRM the agencies lowered fuel price assumptions through 2025 by 30% to 40% using Department of Energy forecasts – a significant drop from the levels projected in 2012. When gas is relatively inexpensive, fuel economy improvements save customers less money at the pump. Consumers in turn have less incentive to pay for expensive fuel saving technology, instead choosing to invest in other features or vehicle attributes like a more capable powertrain, a better infotainment package, or other non-auto priorities within their personal budget.

Second, the last several years have witnessed an organic shift in consumer buying patterns away from higher fuel economy small and midsize passenger cars toward more capable crossovers and utility vehicles. Industry and regulators clearly did not anticipate this market shift in 2012. The forecasts referenced by the agencies at that time showed cars increasing from 50% to 57% of annual vehicle sales by 2025.² However, as shown below in Figure 1, as of 2018, car sales have actually dropped to 31% of the total fleet– the opposite of the expected trend. Over the same period, the utility vehicle market share has grown from 32% to over 47%.

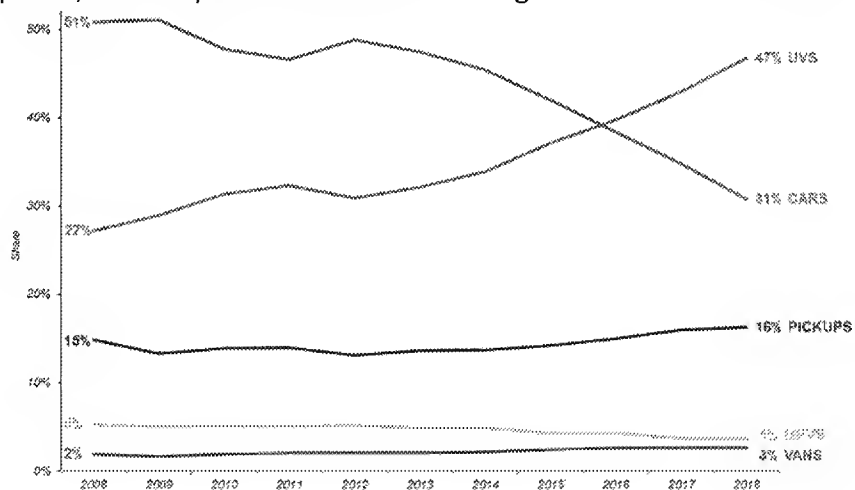


Figure 1: Market for cars is shrinking, displaced by growing demand for UVs

As shown below, this shift in consumer preference presents a compliance problem, even in a footprint-based standards system.

² 2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards, 77 Fed. Reg. 62624, 62680 Table II-2 (Oct. 15, 2012).

A UV with the same footprint as a sedan can lose up to 4MPG.

As shown in Figure 2, a crossover or utility vehicle (UV) that has the same powertrain and technology as a sedan with the same footprint will achieve 2-4 mpg lower fuel economy. In a world of low gas prices, this has proven to be a trade-off that consumers are willing to make for the versatility of a crossover or UV. These real world market shifts were precisely the reason that the industry sought – and CARB/EPA/NHTSA agreed to – a midterm evaluation.

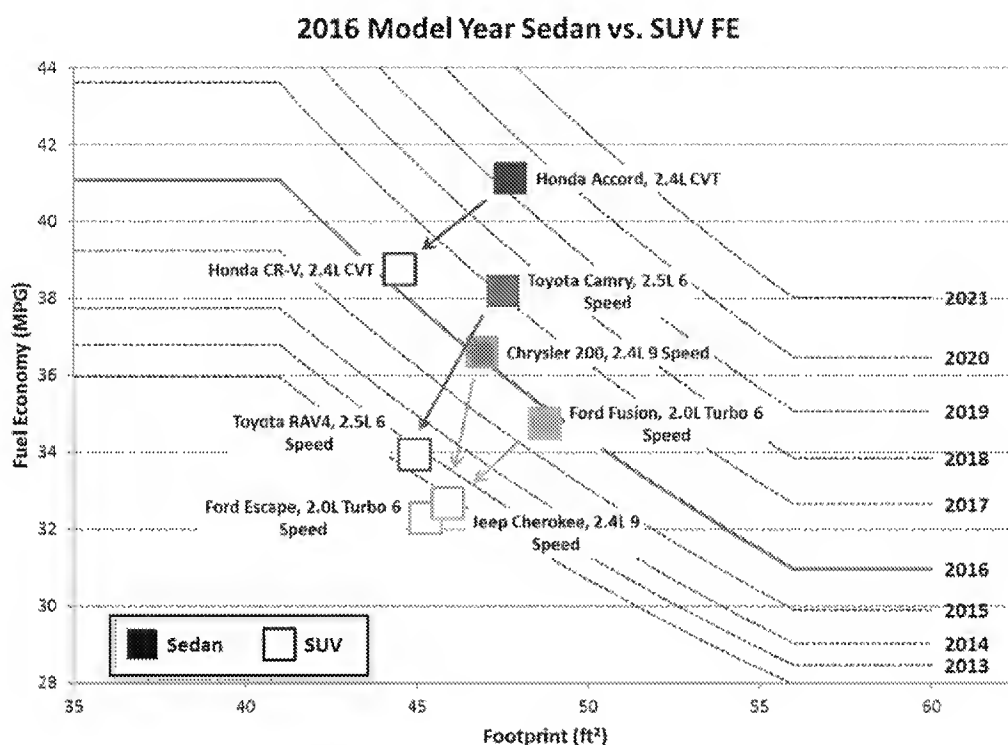


Figure 2: UVs can lose up to 4 mpg compared to sedans with the same footprint and powertrain technology³

Finally, even though the industry has more than quadrupled the number of hybrid and plug-in electric product offerings over the last decade, these vehicles collectively comprise a very small percentage of annual sales. These technologies are available across a range of vehicle types and price points. Plug-in hybrid and battery electric vehicles are eligible for significant federal tax credits and, often, state tax credits or other incentives such as access to high occupancy vehicle lanes or special parking. But while the industry is shifting more focus to develop electrification technologies, the combination of low gas prices and consumer concerns over product cost and range have inhibited uptake. The reality that residual values of electrified vehicles can be as much as 40% below those vehicles with a conventional powertrain compounds the financial concerns for prospective consumers. Even with the incentives described above, hybrid and plug-in electric vehicles still only account for 1.5% of US market, and the combined U.S. market share of all hybrid and plug-in electric products has remained virtually flat at roughly 3% as shown in Figure 3.

³ Footprint data from CAFE Model for 2018 NPRM for Model Years 2021-2026 Passenger Cars and Light Trucks Central Analysis, *File:2018_NPRM_market_inputs_ref.xlsx*, available at <https://www.nhtsa.gov/corporate-average-fuel-economy/compliance-and-effects-modeling-system>; Fuel Economy data from 2016 FE Guide for DOE-OK to release-no-sales-4-27-2017Mercedesforpublic.xlsx available at <https://www.fueleconomy.gov/feg/download.shtml>.

<i>Technology</i>	<i>2008</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>	<i>2016</i>	<i>2017</i>	<i>2018-07</i>
HEV/PHEV/BEV/FCV	2.3%	3.7%	3.4%	2.8%	2.8%	3.2%	3.3%
HEV	2.3	3.1%	2.7%	2.1%	1.9%	2.1%	1.8%
BEV/PHEV	0%	0.6%	0.7%	0.7%	0.9%	1.1%	1.5%
Industry EV Model Count ⁴	18	66	74	78	77	83	80

Figure 3: Market take rates for electrified products has remained low.⁵

In the 2012 Final Rule, EPA stated that MY2025 compliance could be achieved with minor levels of strong electrification. The Draft TAR and Proposed Determination also predicted low levels of electrification. FCA has informed EPA on numerous occasions, most recently in FCA's CBI comments to the Draft TAR, that the company projects compliance would require much greater levels of electrification. The industry has made similar comments highlighting the compliance need for more electrification. FCA believes, and 6 years of market performance proves, there is insufficient market demand for such high levels of strong electrification.

The Noncompliance Gap Demonstrates Regulatory Mismatch with Current Market Reality

Despite continued investment by FCA and its competitors, the industry failed to meet standards for the first time in MY2016 without using credits earned in previous years. That noncompliance gap (Figure 4) – which independent IHS forecasts estimate will grow to almost 3.5 miles per gallon by MY2020 – clearly demonstrates that the assumptions made seven years ago about the U.S. automotive market need to be corrected in this rulemaking.

Actual fleet performance is the most important and valuable metric agencies can and should reference in order to establish what the new plan should be moving forward. It represents what the market is accepting, the costs realized and the performance achieved. It provides a factual baseline – immune from rhetoric or politics – for establishing a new path forward.

⁴ Minimum of one registration in a calendar year; each EV type is a unique count

⁵ IHS Registrations through July 2018 excluding medium-duty, heavy-duty and bus.

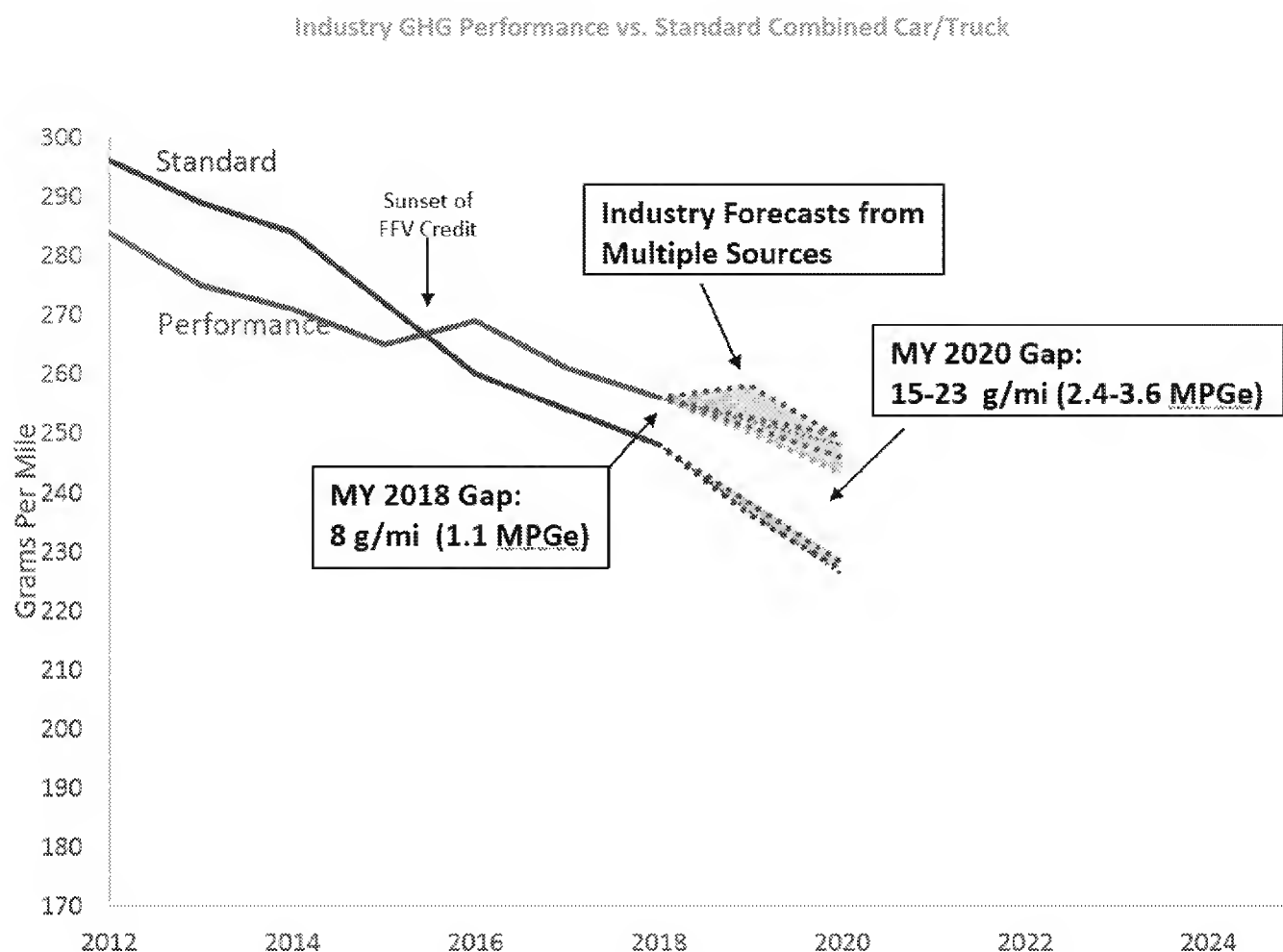


Figure 4: Industry is improving, but not at forecasted rates.⁶

Even with the agency-preferred alternative that keeps the MY2020 standard flat, the industry would need to continue to improve fuel economy and GHG emissions. In fact, to make up for the noncompliance gap and be credit neutral in MY2025, industry will need to improve at a rate greater than what has been historically achieved (see Figure 5). A flat standard drawn from an unachievable MY2020 target requires significant continued improvement by industry.

⁶ MY2012-2016 standards and performance: EPA Manufacturer Performance Report for the 2016 Model Year (Jan. 2018); MY2017-2018 standards and performance: Novation Analytics Baseline Study (Oct. 2018); MY2019-2020 standards: NPRM Volpe Model central analysis (CO₂) (adjusted and not adjusted for AEO2018 car/truck mix); IHS Markit VPac (Sep. 2018) 2019-2020 performance: IHS Markit VPac (Sep. 2018); 1.3% per year (average MY2000-2011 tailpipe rate); 2% per year (average MY2005-2017 tailpipe rate); linear fit of 2012-2018; linear fit of MY2016-2018

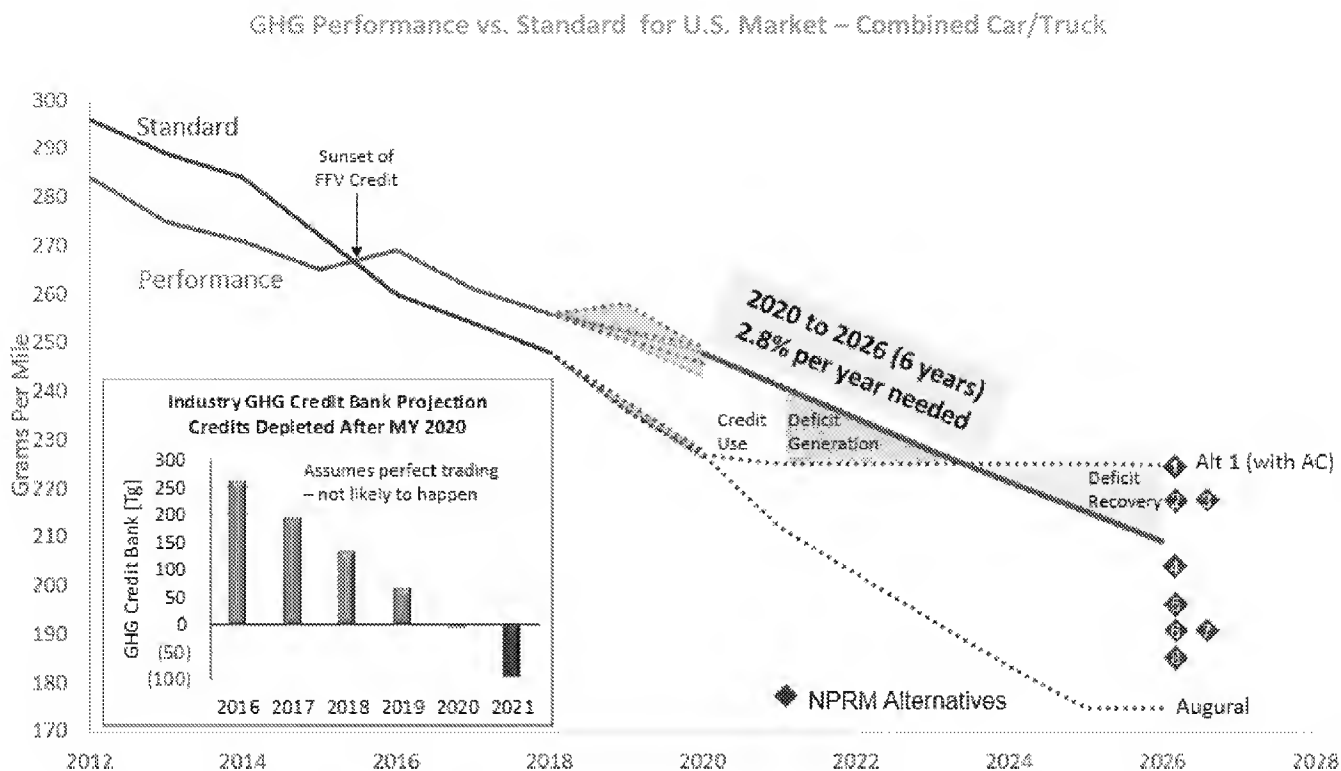


Figure 5: Future standards must recognize realities of industry performance and the compliance deficit⁷

Under the current regulation the industry is in a deficit position that will continue to grow through MY2020. In developing a final rule, the agencies must consider the fact that this deficit position more accurately reflects the confluence of technology costs, vehicle affordability and consumer preferences than the targets that were set in 2012 – and revise the targets for MY2021 accordingly.

FCA Agrees with the Agencies that Footprint Curves Need to be Adjusted

Overall or “net” stringency is a product of footprint-based requirements and flexibilities. The overwhelming industry consensus supports stringency reduction to better align with market realities. Added flexibilities that either help to quantify real world benefits not captured during laboratory conditions or help incentivize longer term technologies are one way to address net stringency (as opposed to footprint curve changes), but FCA believes that added flexibilities alone are not enough to address the issue and can cause other concerns. While the agencies have recognized the value of flexibilities, such as the alternative methodology process for off-cycle credits,⁸ the process of fully acknowledging their benefit has been bureaucratic and lengthy with an uncertain outcome – actually working against the agencies’ original intent to further promote these benefits.

In addition, when flexibilities are considered while setting targets, they cease to be flexibilities and become simply additional technology mandates. Further, in the current regulation certain flexibilities do not apply to CAFE and GHG programs equally. For example, Advance Technology Vehicle (ATV) Multipliers are a GHG-only flexibility that can help to incentivize advanced technology. If consumers responded, there would be a large impact on GHG net relief but ATV multipliers are not present in the CAFE program – resulting in further disharmonizing the CAFE and GHG programs.

⁷ *Id.*

⁸ 40 C.F.R. § 1869-12(d).

FCA believes that changes to the footprint standards are the most direct and efficient way to provide the relief necessary while minimizing conflicts between the NHTSA and EPA programs and minimizing the agency resources necessary to administer the programs. If the agencies use added flexibilities to make stringency adjustment that both programs cannot accommodate equally, the agencies need to harmonize net stringency by increasing the offset in CAFE and GHG footprint curves. FCA supports ongoing fuel economy improvements in the fleet, but all policy adjustments need to acknowledge today's market realities are different from 2012 forecasts as described above.

FCA Supports Additional Flexibilities and Changes to the Compliance Programs

While FCA is recommending changing the footprint curves as the "priority" adjustment needed, addressing deficiencies in the existing flexibilities and adding new flexibilities can help incentivize advanced technologies (e.g., electrification) and provide a bridge to compliance if the necessary customer uptake of the electrification technologies does not develop in the market. FCA recommends the following:

Extend and Expand Existing ATV Multipliers

FCA continues to support working towards "One National Program" (ONP) that allows us to build one fleet that complies with NHTSA, EPA and CARB fuel economy and GHG regulatory requirements. With that said, we also recognize California's separate commitment to expanding high voltage electrification in the fleet. FCA supports a CARB-developed methodology⁹ that scales ATV incentives over time using the cost-benefit ratio of the ATV compared to conventional vehicle with both benefits measured from the required standard. This methodology acknowledges that one way that an OEM can select a technology is based on its cost-benefit ratio, and having a multiplier available can incentivize that technology. This ratio by itself would equally balance the cost-benefit of the two technologies, so an adjustment factor is then used to tip the balance to incentivize the advanced technology and minimize the risk for manufacturers. The CARB methodology yields a 4.5 ATV multiplier for BEVs and a 4.8 multiplier for PHEVs. The calculations and further discussion on the ATV multipliers is contained in Appendix 1.

While one may question the size of the PHEV multiplier, EPA's costs for PHEVs (with their two powertrains) are almost as high as BEV costs, and the benefits are less. As a result, the PHEV calculations actually yielded higher multipliers than BEVs. These higher PHEV multipliers using CARB's method are supportable because BEV range anxiety is a major hurdle for OEMs. Without prevalent fast charging stations to address this BEV concern, PHEVs could be the dominant technology through MY2026 that bridges the gap until BEVs are more market acceptable.

Include 2WD SUV in LDT Fleet

2WD SUVs have a combination of truck-like characteristics (e.g., elevated/off-road seating position coupled with expanded cargo carrying ability) that customers prefer but they are saddled with increased energy demand driven by the fundamental physics of these consumer-demanded characteristics. The agencies should revise current truck-like criteria in order to align the regulation with the underlying physics by modifying 49 CFR § 523.5(a) to include:

- Extended roof-line and expanded cargo capacity (1 row fold flat), and
- <6000 lbs. GVWR and meets 4 out of 5 off-road criteria (from 49 C.F.R. § 523.5(b))

⁹ Comment submitted by Michael Carter, Assistant Division Chief, Mobil Source Control Division, California Air Resources Board (CARB), <https://www.regulations.gov/document?D=EPA-HQ-OAR-2014-0827-1968>.

Expand Off-Cycle Credit Table Caps

From MY2012 to MY2016, industry's application of off-cycle technologies to the U.S. fleet has tripled¹⁰ (2X on car fleet and 4X on truck fleet) to 3 g/mi. This is the application rate of technology resulting from an all-new regulatory mechanism – a recognition of technologies that have on-road fuel economy and GHG emissions benefits that are not completely captured during laboratory conditions. With this learning phase now complete, the industry expects this trend at a minimum will continue at the current rate but more likely accelerate, exceeding the existing 10 g/mi cap in the MY2021-2026 timeframe.

Knowing that this regulatory mechanism incentivizes industry innovation, manufacturers need regulatory certainty to fund the needed investments in the technology. Therefore, FCA recommends removing the 10 g/mi off-cycle table cap completely and unleashing industry innovation. Left in place, the agency cap is stifling the intent of the off-cycle mechanism.

The agencies specifically ask in the NPRM if the cap should be reset to 10% of an individual OEM's tailpipe performance or to 15 g/mi. These are both less desirable paths than completely removing the cap, because they still very likely could hamper certainty and thereby technology innovation and implementation. If a cap were deemed necessary, our preferred alternative is to set the cap at 10% of the individual OEM fleet's performance. This path works much like attribute-based standards. That is, it would acknowledge that a given technology would have a greater gram/mile savings if the base vehicle had higher energy demands (i.e., a large versus small vehicle). FCA's third choice would be the most limiting, increasing the cap to a constant 15 g/mi.

There is discussion in Appendix 2 that responds to NPRM questions about combining portions of the Off-Cycle and A/C tables. We believe the cap removal methodology applies to both of these currently separate regulatory mechanisms.

Improve Off-Cycle Technology Process

There are general efficiency improvements that would help with the administration of the off-cycle program that are discussed more in Appendix 1 and Appendix 2. These include, (1) simplifying the on table credit menu, (2) adding more technologies to the default table to avoid the lengthy alternative methodology, and (3) improving the alternative methodology approval process that has been lengthy and uncertain.

Retain Non-CO₂ Compounds (Low GWP Refrigerant, Methane, Nitrous Oxide)

FCA continues to support ONP for CAFE and vehicle GHG emissions and, as such, we support the Alliance position to keep low-GWP refrigerant, methane (CH₄), and nitrous oxide (N₂O) in the current regulatory structure instead of promulgating new, separate rules.

We believe leaving these compounds in the current rule is the best course of action. While the low-GWP refrigerants are a valid method of reducing GHGs, FCA is concerned that without a federal rule these could be regulated by a patchwork of differing state regulation. Regarding methane and nitrous oxide, we value the flexibility of offsetting overages with an equivalent CO₂ adjustment. This is most easily accomplished in the existing regulation, and we have concerns about how this would be addressed in a separate regulation. However, if it is determined that these elements will be part of a new rulemaking, we would work with the agencies to develop a rule that provides similar flexibilities.

¹⁰ U.S. Environmental Protection Agency, "GHG Emission Standards for Light-Duty Vehicles: Manufacturer Performance Report for the 2016 Model Year," EPA-420-R-18-002 Table 3.17 (Jan. 2018) (EPA 2016 GHG Performance Report).

In the proposed rule, “EPA also seeks comment on whether to change existing methane and nitrous oxide standards that were finalized in the 2012 rule.”¹¹ FCA requests EPA eliminate the CH₄ and N₂O requirements completely. The Alliance made a similar request in its comments on regulatory burden relief in May of 2017.¹² There are at least four rationale for removing this requirement:

- Gasoline engine performance is within the current standards. Only a limited subset of vehicles, E85 FFVs (with declining sales) and diesel (with relatively low sales compared to gasoline), are challenged by the current CH₄ and N₂O requirements.
- The measurement of N₂O is burdensome and the technologies used to measure it are still evolving.
- Catalysts have limited impact on CH₄ and N₂O, as CH₄ can pass through the catalyst easily, and N₂O formation occurs inside the catalyst due to the incomplete reduction of NO_x in the after treatment system.
- In EPA’s 2016 GHG Performance Report, total industry CH₄ and N₂O emissions in excess of standards accounted for 0.045% of the total GHG emissions.¹³

Given this minimal contribution to the GHG inventory and the accompanying testing/reporting compliance burdens, FCA believes that the agencies’ GHG goals could be achieved without regulation of CH₄ and N₂O.

If the regulation of CH₄ and N₂O continues, we believe that there should be an option for fleet averaging with family emission limits (FELs), similar to other substances that are regulated in the GHG and criteria emissions regulations, for both under and over the current standards. This would enable high performing applications to offset lower performing applications without introducing a CO₂ penalty.

FCA Supports NHTSA’s Consideration of the Economic and Safety Impacts of CAFE/GHG Standards

As FCA has previously commented to the agencies, vehicles on the road today are approaching a record average age of nearly 12 years. As the cost of new technologies exceeds what customers are willing to pay, this average vehicle age may increase further as consumers decide to hold onto their current vehicles longer or purchase their next vehicle from the used vehicle market. In either case, the benefits of safer, cleaner, and more fuel-efficient vehicles are not realized.

The agencies acknowledged the risk of an aging fleet in the Draft TAR and FCA agrees with the latest concerns raised in this rulemaking as the agencies now assess the possible safety impacts of that outcome. FCA agrees with the agencies’ concerns that an unintended consequence of the current augural stringency of the CAFE/GHG regulations may be a decreasing trend in vehicle scrappage rates as consumers delay purchases.

It is appropriate for the agencies to consider the improvement in consumer safety that could be impacted by delayed fleet turnover and the safety impacts of increased VMT when considering the stringency of the CAFE/GHG standards. The current CAFE/GHG regulation was developed with an expectation of high gas prices but is unfolding in a period of sustained low gas prices, strongly impacting payback (and consumer choice). Given lower gas prices, and a vehicle fleet with increasing gas mileage under the augural standards, the

¹¹ 83 Fed. Reg. at 42988.

¹² Alliance of Automobile Manufacturers Comments to EPA on OAR on Regulatory Burden, Issue 1.30, Docket ID #EPA-HQ-OA-2017-0190, (May 15, 2017).

¹³ Calculated from data in EPA 2016 GHG Performance Report tbls.B-1, 3-23, 3-27, 3-28.

agencies' conclusions that consumers will make the economic choice to increase Vehicle Miles Travelled (VMT) is reasonable.

We provide further analysis of this point in Appendix 1.

FCA Continues to Support One National Program

FCA continues to support ONP for Corporate Average Fuel Economy (CAFE) and vehicle Greenhouse Gas (GHG) emissions and we were pleased when the White House and California Air Resources Board (CARB) issued a joint press statement at the end of August expressing the "shared goal of achieving one national set of standards for vehicle fuel economy and greenhouse gas emissions."¹⁴ As stated in our public hearing testimony on September 25, 2018, FCA agrees with EPA and NHTSA that the most direct way to align the program with market realities is by adjusting the footprint curves that define a vehicle's basic fuel economy requirements. We also recognize California's commitment to expanding electrification of the fleet. It is our view that those two elements – standards adjusted to reflect market realities and expanded credits to incentivize electrification – could form the basis of a potential agreement.

FCA Agrees with the Agencies' Assessment of Preemption

As noted above, it remains our hope that conflicts over preemption will be avoided by an agreement to modify ONP to address evolving market realities; however, in the absence of such an agreement, FCA agrees that the law gives the federal government the authority to preempt state standards that are directly related to fuel economy. As described in the NPRM, "tailpipe CO₂ emissions standards are directly and inherently related to fuel economy standards."¹⁵ The mathematical relationship between the two is undeniable, and our understanding of that relationship has only grown as the program matures. In addition, any state GHG standards that limit tailpipe CO₂ emissions would impact how manufacturers comply with federal fuel economy standards. As such, there is a strong argument that EPCA expressly and impliedly preempts state GHG standards that limit CO₂ tailpipe emissions. For similar reasons, ZEV mandates could reasonably be found to be preempted by EPCA as well.

Additional Recommendations Addressed in More Detail in FCA's Attached Appendices

The agency requested comment on a number of other specific issues. FCA responds in more detail to these requests in the Appendices, which provide the rationale for supporting each of the following recommendations:

- No changes are needed for the current vehicle classification/measurement procedures
- Maintain the CAFE credit trading program as-is with no additional reporting requirements
- Provide an Improved Off-Cycle Credit Approval Process
- Make certain procedural improvements to the 5 cycle process
- Better harmonize Off-cycle and A/C Efficiency (Indirect) credits in CAFE program
- Correct VMT used in early part of program to align with VMTs used for MY2017 through MY2025

Conclusion

We agree with NHTSA and EPA that the current standards are not appropriate. Market challenges that were not foreseen by the agencies at the time of their rulemaking in 2012 have since made it difficult for automakers to

¹⁴ Press Release, White House, Dep't of Transp., Env'tl. Prot. Agency, Cal. Air Resources Bd., Joint Statement on SAFE Vehicles Rule (Aug. 29, 2018).

¹⁵ 83 Fed. Reg. at 42987.

achieve the required GHG and fuel consumption reductions. The Mid Term Evaluation, agreed to by all stakeholders, was put in place to assess changes in the regulatory landscape, including market challenges.

FCA supports an alternative that allows industry and FCA to close the growing compliance gap with continued improvements from today's fuel economy and greenhouse gas levels at a challenging but market feasible rate. We believe the best 50-State NPRM alternative to accomplish this would include:

- Significant adjustment to the footprint-based standards (model-years 2021 to 2026) to reverse the widening compliance gap and its anticipated impact on credit availability, while maintaining performance improvement;
- Adjustments that equalize the larger compliance task on trucks versus cars today
 - Recognize 2WD UVs for their truck-like capability
- Extended/expanded multipliers for plug-in hybrid and battery-electric vehicles, under CAFE and GHG regulations, to encourage wider adoption of electrification as the industry continues to address those factors which limit its proliferation, i.e., infrastructure development, technology cost and vehicle range;
- Increased EPA GHG to NHTSA CAFE footprint curve offset to account for all differences that cannot be harmonized;
- Actions that reduce industry risk due to market uncertainty of advanced technologies, such as:
 - Extending/expanding ATV credits to further encourage advanced technology propagation
 - Expanding/simplifying off-cycle credit programs;
- Continued acknowledgement that upgraded refrigerants and improved refrigerant management benefit the GHG program;
- Freeing auto manufacturers from responsibility for upstream emissions produced during electricity generation;

FCA stands ready to work collaboratively with NHTSA, EPA and CARB to support the elements noted above to define a successful ONP for MY2021-2026.

Sincerely,



Mark Chernoby
Head of Vehicle Safety and Regulatory Compliance
FCA US LLC

Message

From: Raburn, Janice [Janice.Raburn@bp.com]
Sent: 10/2/2018 10:12:44 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
CC: Dominguez, Alexander [dominguez.alexander@epa.gov]
Subject: BP list of participants for 10/4/18 meeting

Mandy and Alex,

Below is the list of BP folks who will participate in our meeting on October 4, 11 am – 12 pm on the RFS RIN market.

- Bob Stout, VP and Head of Regulatory Advocacy & Policy, BP America, Inc.
- Janice Raburn, Senior Director, Fuels Regulatory Advocacy, BP America, Inc.
- Teresa Lopez, Global Environmental Products Trading Manager, Global Oil Americas
- Vincent Johnson, Head of Commercial Advocacy and Regulatory Affairs, Global Oil Americas
- Jim Bordignon, Integrated Supply & Trading (IST) Compliance Manager
- Mark Bunch, Regulatory Issues Strategist, Fuels NA

Best regards,
 Janice

Janice K Raburn

BP America Inc. | Senior Director, Fuels Regulatory Advocacy

office: 202.346.8516 | mobile: 202.210.8540
 1101 New York Avenue, NW Suite 700 | Washington, DC 20005

From: Raburn, Janice
Sent: Wednesday, September 26, 2018 2:45 PM
To: 'Gunasekara.mandy@Epa.gov' <Gunasekara.mandy@Epa.gov>
Cc: 'Dominguez, Alexander' <dominguez.alexander@epa.gov>
Subject: BP proposal

Hello Mandy,

The BP team is looking forward to meeting with you on October 4. We will provide a BP perspective on how the RFS RIN market works.

In addition, we would like to present a proposal, briefly summarized below. Attached is supporting documentation – I may provide other documents in advance.

The proposal, in short:

BP continues to oppose the extension of the 1# waiver to E15, as we do not think EPA has legal authority to do so. If EPA moves forward with the 1# waiver rulemaking, we support EPA setting ethanol blending at no more than 10% (blendwall) in annual RVOs, Reset, and/or Set rulemakings. This would reduce RIN volatility, remedy small refiner RIN concerns, and eliminate the need for small refinery exemptions

We continue to hear that EPA may also propose a rule aimed at RIN transparency. BP supports RIN market transparency and liquidity but believes no major rulemaking is needed at this time. BP opposes limiting RIN transactions and market participants. EPA's sulfur and benzene credit programs work in this manner, and they have very limited liquidity and transparency. If EPA must propose such a rule, BP thinks quarterly compliance could possibly work. BP has a proposal (attached) on how to implement quarterly compliance; it includes a way to address the cellulosic waiver credit (CWC) so as to address the interests of both obligated parties and cellulosic RIN generators.

Best regards,
Janice

Janice K Raburn

BP America Inc. | Senior Director, Fuels Regulatory Advocacy

office: 202.346.8516 | mobile: 202.210.8540
1101 New York Avenue, NW Suite 700 | Washington, DC 20005

Message

From: Flynn, John [john.flynn@squirepb.com]
Sent: 10/1/2018 9:17:14 PM
To: Tim Nolan (TNolan@toteinc.com) [TNolan@toteinc.com]
CC: jhenry@trans-inst.org; Peter Keller [PKeller@toteinc.com]; Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: EPA Update, October 1

Tim,

I just received a phone call (voice mail) from Mandy Gunasekara, Senior Policy Advisor to EPA Administrator Wheeler.

Jeff Lantz responded to Mandy's email that she sent last week on "EPA Concurrence on TOTE's Permit."

The response included a request from Rear Admiral (RADM) John Nadeau to meet with EPA Assistant Administrator Wehrum early next week (week of 8 October).

I placed a return call to Mandy with hopes of receiving additional details on RADM's Nadeau request to meet, open Coast Guard issues, etc. Senator Lott also placed a call to Administrator Wheeler and Assistant Administrator Wehrum. I'll let you know as soon as we connect at respective levels.

In the meantime, it would be timely and appropriate to double back with Jeff Lantz as soon as possible. Needless to say, we want to make sure that there aren't any open issues with the Coast Guard before RADM Nadeau and Mr. Wehrum meet next week.

I have a first-hand report from Sen. Lott that he received from EPA. I'll call Jeff Lantz shortly and running traps on best approach to reach out to RADM Nadeau. I know him well, but need to be tactical on timing since we've been working directly with Jeff Lantz.

Regards,
john



John P. Flynn
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Washington, DC 20037
T +1 202 457 5141
O +1 202 457 6000
F +1 202 457 6315
john.flynn@squirepb.com | squirepattonboggs.com

Message

From: Small, Jeff [Jeff.Small@mail.house.gov]
Sent: 9/28/2018 6:08:18 PM
To: Ringel, Aaron [ringel.aaron@epa.gov]; Palich, Christian [palich.christian@epa.gov]; Rodrick, Christian [rodrick.christian@epa.gov]; Abboud, Michael [abboud.michael@epa.gov]; Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: FW: Upcoming Western Caucus Events
Attachments: ATT00001.txt; Upcoming 2018 Congressional Western Caucus and Western Caucus Foundation Events updated 9.28.18.pdf

FYI on upcoming events.

Jeff Small

Executive Director | Congressional Western Caucus
Senior Advisor | Congressman Paul A. Gosar, D.D.S.
 2057 Rayburn HOB | Washington, DC 20515

From: Small, Jeff
Sent: Friday, September 28, 2018 2:05 PM
To: Small, Jeff
Cc: Hanson, Tanner
Subject: Upcoming Western Caucus Events

Upcoming Meetings & Events...

1. **Cancelled: Western Caucus Member-Only Meeting** | Tuesday, October 2nd | 12:00 – 1:00 p.m. | 2247 RHOB | Catered lunch provided
 - This lunch meeting has been cancelled due to Majority Leader McCarthy's announcement that no House floor votes are expected in October and that the House will return Nov. 13.
2. **Western Caucus Foundation Harvest Reception** | For Staff and Foundation Supporters-Only (unless a Member happens to be in town) | Thursday, October 4th | 5:30 – 7:30 p.m. | Public Lands Council Rooftop 1275 Pennsylvania Avenue NW | Drinks provided
 - Please RSVP [HERE](#).
3. **Western Caucus Foundation Staff-Only Monthly Bicameral Policy Meeting** | Friday, October 12th | 9:30 – 10:45 a.m. | SVC Room TBA | Breakfast provided
 100-120 House and Senate staffers, staff from multiple federal agencies, leadership and committee staff as well as speakers from industry attend this monthly staff policy meeting.

4. Western Caucus Member-Only Meeting with EPA Administrator Andrew Wheeler | Thursday, November 15th | 12:00 – 1:00 p.m. | 2247 RHOB | Catered lunch provided

- EPA Administrator will present, take questions and engage in discussion with our members on their priorities during the Member meeting.
- Please RSVP or send regrets to jeff.small@mail.house.gov and tanner.hanson@mail.house.gov.

Save the Dates (Updated 9.28.18)

Upcoming 2018 Congressional Western Caucus and Western Caucus Foundation Events



Congressional Western Caucus Member Only Lunch Meetings and Speaker Series

Thurs 11/15/18: 12:00-1:00 p.m. Speaker: EPA Administrator Wheeler. Location: 2247*



Foundation Staff Only Monthly Bicameral Policy Meetings

Location: U.S. Capitol, SVC Rooms

Fri 10/12/18: 9:30-10:45 a.m. Location: TBA*

Fri 11/30/18: 9:30-10:45 a.m. Location: TBA

Foundation Trips and Other Events, Members and Staff invited

10/4/18: 5:30-7:30 p.m. Harvest Reception at Public Lands Council Rooftop 1275 Pennsylvania Avenue NW*

11/15/18: Western Caucus Chiefs of Staff Reception on the Hill

12/7/18-12/8/18: Winter Western Roundtable and Field Tour in Nevada

12/12/18: 5:30-7:00 p.m. Holiday Reception in DC

*Indicates recently added/modified

Message

From: Derby, Rachel [RDerby@cement.org]
Sent: 9/18/2018 10:57:22 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Re: PCA Environment & Energy Committee Meeting - October 4

Thank you, you are always so helpful! I'm currently in China but when I get back it would be great to catch up for lunch in October. Let me know the date and location that is best for you.

Rachel Derby
 Vice President of Government Affairs
 Portland Cement Association
 Mobile: 202.679.8223<tel:202.679.8223>
 Direct: 202.719.1983<tel:202.719.1983>

On Sep 19, 2018, at 1:09 AM, Gunasekara, Mandy
 <Gunasekara.Mandy@epa.gov<mailto:Gunasekara.Mandy@epa.gov>> wrote:

Hi Louis,
 I'd be happy to speak to the group. I'm ccing Alex to help with the logistics.
 Best,
 Mandy

Sent from my iPhone

On Sep 18, 2018, at 10:44 AM, Baer, Louis <LBaer@cement.org<mailto:LBaer@cement.org>> wrote:

Mandy,

I am following up on our invitation last week to speak at PCA's Environment & Energy Committee Meeting on Thursday, October 4. Our meeting will take place at the National Association of Manufacturers (733 10th St. NW 7th Floor). Please let us know if you available that day for 30 minutes and our group would love to hear you speak on the current priorities and progress you are making at the Office of Air & Radiation. Thank you!

Best,
 Louis

Louis A. Baer, Esq., CPEA
 Director/Assistant Counsel, Government Affairs
 Portland Cement Association
 1150 Connecticut Avenue NW, Suite 500
 Office: 202-719-1981
 Cell: 314-922-8041
 lbaer@cement.org<mailto:lbaer@cement.org>
 www.cement.org<http://www.cement.org>

From: Baer, Louis
 Sent: Monday, September 10, 2018 4:25 PM
 To: 'gunasekara.mandy@epa.gov<mailto:gunasekara.mandy@epa.gov>' <gunasekara.mandy@epa.gov<mailto:gunasekara.mandy@epa.gov>>
 Cc: Franklin, Charles <CFranklin@cement.org<mailto:CFranklin@cement.org>>; Derby, Rachel <RDerby@cement.org<mailto:RDerby@cement.org>>
 Subject: PCA Environment & Energy Committee Meeting - October 4

Mandy,

We hope you are doing well and having a great summer. Thank you again for meeting with us and our members in April to discuss the air issue priorities for the cement industry.

PCA's Fall Environment & Energy Committee Meeting is being held here in D.C. at the National Association of Manufacturers (733 10th St. NW) on Thursday, October 4 and we would like to invite you to speak to our members. Our members would be very interested to hear further about the progress you and your colleagues at the Office of Air & Radiation are making on various air issues, such as the NAAQS and the recently proposed Affordable Clean Energy Rule.

Are you available to speak to our members at 10 AM on Thursday, October 4 for 30 minutes? The Environment & Energy Committee Meeting will have around 30-35 people and consist of senior environmental and

government affairs leaders at our member companies. Our schedule is flexible so if there is a better time on Thursday, October 4, we can accommodate your schedule.

Please let us know if you are available to speak. We look forward to hearing from you.

Best,
Louis

Louis A. Baer, Esq., CPEA
Director/Assistant Counsel, Government Affairs
Portland Cement Association
1150 Connecticut Avenue NW, Suite 500
Office: 202-719-1981
Cell: 314-922-8041
lbaer@cement.org<mailto:lbaer@cement.org>
www.cement.org<http://www.cement.org>

Message

From: Steve Mueller [steve.mueller@amerpower.com]
Sent: 9/29/2018 2:23:59 AM
To: Wehrum, Bill [Wehrum.Bill@epa.gov]; Atkinson, Emily [Atkinson.Emily@epa.gov]; Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
CC: Carrie Annand, BPA [carrie@usabiomass.org]; Lincoln, Jack [jack.lincoln@mail.house.gov]
Subject: Re: Biomass eRin program support
Attachments: EPA RFS Letter 26Sept18 Loyalton Cogen.pdf

Hit the 'send' button w/o the attached letter!

Steve

Steven Mueller
President
ARP-Loyalton Cogen LLC
100 South Railroad Avenue
Loyalton, CA 96118
Direct: +1-530-708-1776

On Sep 28, 2018, at 7:20 PM, Steve Mueller <steve.mueller@amerpower.com> wrote:

As a member of the Biomass Power Association and an owner of a 20MW renewable biomass cogeneration plant in Northern California, I would greatly appreciate your review and consideration of our request to expedite internal administrative approval for the application of eRIN's for all qualified biomass plants in the US.

We are a relatively small capacity but we create substantial quality jobs in rural communities and we are leaders in support of fire-risk mitigation and clean water benefits in the regions we serve.

It would be much appreciated if you could give us some clarity on the Acting Administrator's views with regards to addressing this matter of critical financial importance to our company and for the other biomass power generators across the US.

I am available at any time to discuss this matter in greater detail.

Many thanks.

Steven Mueller
President
ARP-Loyalton Cogen LLC
100 South Railroad Avenue
Loyalton, CA 96118
Direct: +1-530-708-1776



Plant Address: 100 S. Railroad Avenue, Loyalton, CA 96118 **Tel:** (530) 993-4867

Mail Address: PO Box #71, Loyalton, CA 96118

25 September 2018

The Honorable Andrew Wheeler, Acting Administrator
Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

Re: EPA Action to Confirm an Electrical Pathway Under the Renewable Fuel Standard Program

Dear Acting Administrator Wheeler:

I am writing this letter as an owner of a 20MW biomass cogeneration power station located in the Sierra Nevada region of rural northern California. We are surrounded by three of the largest national forests in the western US (the Lassen, the Plumas and the Tahoe). Our plant is the only facility in the region, other than out-of-state landfills, that is able to receive high fire-risk biomass.

Loyalton Cogen delivers renewable electricity to more than 20,000 homes in the Sierra Nevada and employs more than 50 highly paid, skilled workers to operate the plant and transport biomass materials. Our facility is located at 5,000 feet in the high Sierras of northern California. Our county has only 4,500 residents, no traffic lights and is wholly dependent on logging and ranching. It is fair to say that our region has been largely left behind with regards to federal policies that favor other renewable technologies.

Eleven years ago, Congress agreed that that renewably generated electricity should be a pathway under the Renewable Fuel Standard program. Four years ago, EPA decided to approve an electricity pathway for this program. To date, the EPA has yet to act on this approval by processing formal applications from renewable electricity producers across the nation.

The EPA now faces a four-year backlog of applications from power producers seeking registration as RIN producers for biogas-based electricity. More requests are expected following positive findings by the Agency that power produced using certain solid forms of biomass now qualifies under the RFS.

We have recently been informed that, until the Agency resolves policy issues regarding how the RFS "electric pathway" program will function, these applications will not be acted upon. This has completely blocked participation in the RFS electric pathway for both existing and future applicants.

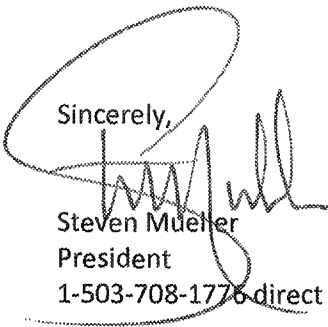
Our request of your office is to direct the EPA to expedite currently outstanding registration requests and that permit the Agency to finalize a formal decision with regards to a regulatory structure for the electric RIN pathway.

EPA's regulatory inaction regarding eRINs appears to have the de facto effect of picking "winners and losers." This was not Congress' intent, nor the EPA separate one class of renewable electric generators from others by inaction.

Within the next five years, without the timely inclusion of eRINs, hundreds of biomass, bio-gas and other forms of reliable, community based renewable power generators will be forced to shut down. These small facilities, located in rural communities and provide critically important jobs, will be lost in the push to build ever-larger, solar electric and wind generation facilities.

We respectfully request your timely attention to this matter which will permit our community and others to participate in the very benefits that Congress established eleven years ago.

Sincerely,



Steven Mueller
President
1-503-708-1776 direct

Cc: Congressman Doug LaMalfa

Message

From: David Schwietert [DSchwietert@autoalliance.org]
Sent: 9/24/2018 2:40:16 PM
To: Wheeler, Andrew [wheeler.andrew@epa.gov]; Jackson, Ryan [jackson.ryan@epa.gov]; Wehrum, Bill [Wehrum.Bill@epa.gov]; Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Lewis, Josh [Lewis.Josh@epa.gov]
Subject: Auto Alliance testimony - CAFE/GHG Field Hearings

<https://autoalliance.org/2018/09/24/alliance-remarks-nhtsa-epa-hearings-fuel-economy-standards/>

Alliance remarks for NHTSA/EPA hearings on fuel economy standards:

September 24, 2018

Fresno, CA: Steve Douglas, Senior Director, Energy & Environment, Auto Alliance
 Dearborn, MI: Chris Nevers, Vice President, Energy & Environment, Auto Alliance

Thank you for the opportunity to speak on our priorities today. We are still working on detailed comments to respond to the Administration's notice of proposed rulemaking. So today, I will focus on important themes that will appear in our comments.

The Alliance and our members appreciate the Administration's efforts to restart the midterm review and continue a single national program for CAFE and greenhouse gas standards. After all, standards must reflect the most up-to-date information to guide compliance. The notice of proposed rulemaking certainly provides stakeholders with a wide range of alternatives on which they can provide robust comments.

First, let me say climate change is real and automakers are taking action to reduce carbon emissions from new vehicles. Automakers are also committed to continued improvements in fuel economy. Today, consumers have more choice in energy-efficient vehicles than ever before. About 500 models are on sale that achieve 30 MPG or more on the highway, and 80 of those models achieve 40 MPG or more. Consumers can choose from 45 hybrid-electric models and another 50 plug-in electric and fuel-cell models. And more electrified vehicles are on their way to market.

As we have often stated, automakers support continued improvements in fuel economy but future standards must account for marketplace realities like consumer acceptance.

Consumer acceptance – which includes affordability – plays a critical role in determining the sustainability of future standards and performance. No one wins if our customers are not buying the new highly efficient products offered in our showrooms. The standards must account for consumer willingness and ability to pay for newer technologies in order for all the benefits of new vehicles to be realized.

Maintaining One National Program for the regulation of fuel economy and greenhouse gases is important to automakers. We urge EPA and NHTSA to continue to work with all stakeholders, including California, to develop a lasting rule that enables manufacturers to plan and build a single fleet of vehicles for the U.S.

I would like to turn now to flexibilities. Flexibilities can reduce fuel use and emissions and at the same time reduce compliance costs, and that helps keep new vehicles affordable to more Americans.

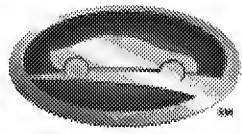
The Alliance supports the ability to incentivize certain technologies, such as electrification, that could prove a key factor in meeting EPA and California's long-term greenhouse gas goals. The Alliance also supports the continuation and expansion of flexibilities such as accounting for the benefits of air conditioning system

efficiency improvements, accounting for new refrigerants with lower greenhouse gas impacts, and fully acknowledging the benefits of technologies that improve efficiency beyond what is measured in laboratory testing.

In closing, automakers support continued improvements in fuel economy while balancing priorities like affordability, safety, jobs, and the environment. We urge California and the federal government to find a common-sense solution that sets continued increases in vehicle efficiency standards while also meeting the needs of America's drivers. One National Program enables us to keep new vehicles affordable, so more Americans can replace older vehicles with models that are cleaner, safer, and more energy-efficient.

#

David Schwietert
Executive Vice President, Federal Government Relations & Public Policy
P: 202-326-5521 | dschwietert@autoalliance.org



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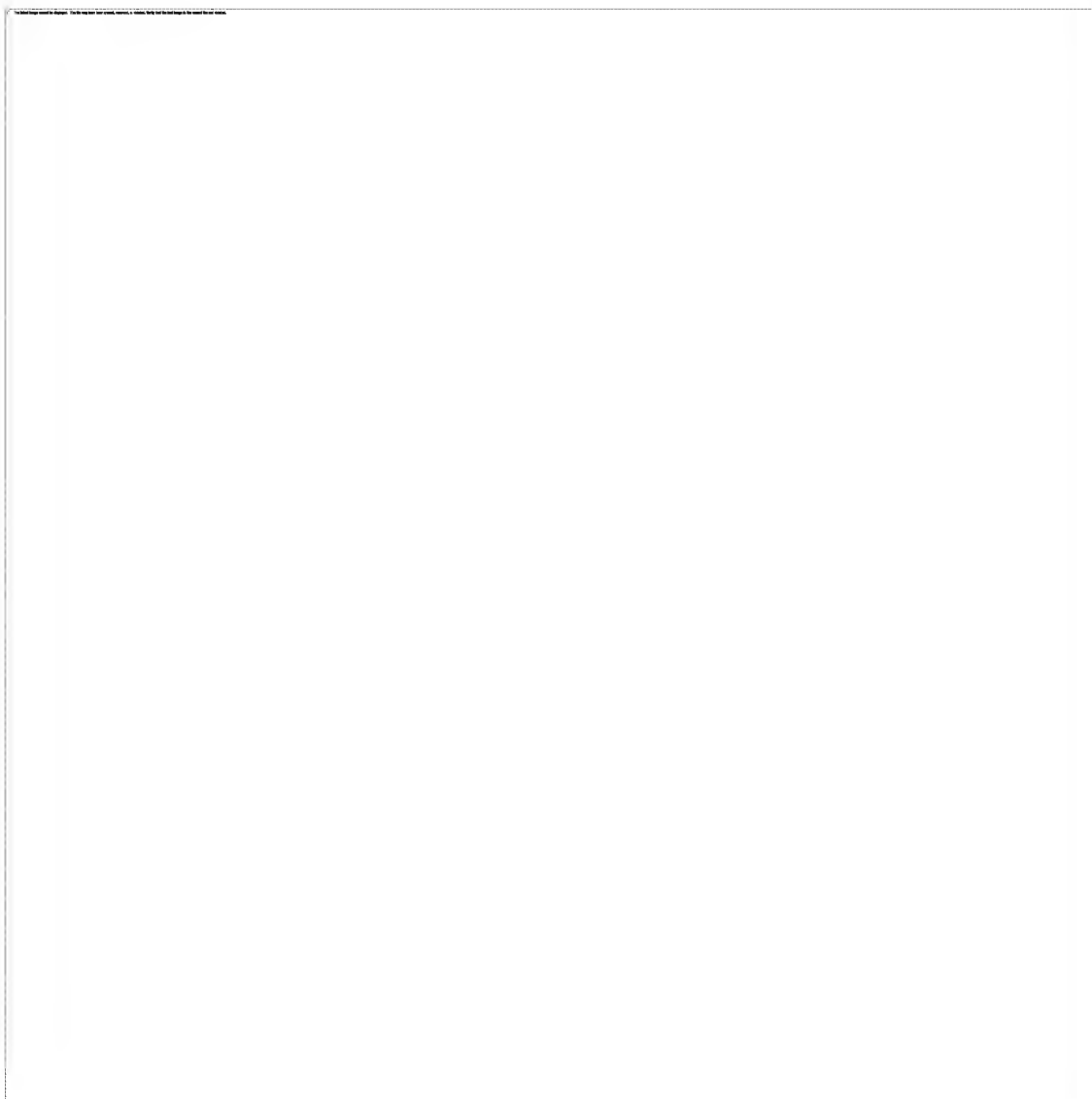
<https://autoalliance.org/>

Curious to know how the Auto sector impacts your state or district -- [Click here](#). To get a better understanding of how America's automobile industry is one of the most powerful engines driving the U.S. economy, [click here](#).

Message

From: Amy Harder [amy@axios.com]
Sent: 10/1/2018 9:29:35 AM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Inside big oil's emerging climate strategy

[View this email in your browser](#)



Good morning from London,

Good morning from London, where I'm speaking at a [Hawthorn Club](#) event, and later this week I'll be checking out some carbon-capture projects in Norway. My latest [Harder Line column](#) provides behind-the-scenes look at an invite-only event last week of the world's biggest oil-company CEOs talking about climate change.

ICYMI from last week:

[Big oil walks tight rope on methane emissions](#)

[Scoop: Shell sits out Washington carbon fight](#)

Cheers,

Amy

Inside big oil's emerging climate strategy

A nascent organization funded by global oil companies to address climate change may seem ironic — but it's a credible effort that could actually have a real impact.

Why it matters: Under pressure from [investors](#) and [lawsuits](#), oil companies [are starting to](#) acknowledge climate change and slowly shift their business models in response.

The intrigue: Last week at the first-ever U.S. meeting of the group, called the Oil and Gas Climate Initiative, a rare and surprisingly candid discussion took

place between CEOs of the world's biggest oil producers and leaders in climate-change action.

- At the invite-only event at the Intercontinental Barclay hotel in Manhattan, roughly 150 people asked questions of 11 oil-company CEOs, including from Saudi Aramco, European producers BP and Shell and Houston-based Occidental Petroleum.
- The guest list was strict and security officers were everywhere. Leaders of several environmental groups were invited, and as the two-hour discussion wore on, the dialogue got increasingly pointed.

Nigel Topping, CEO of a nonprofit coalition called We Mean Business, noted (accurately) that the companies were still overwhelmingly investing in finding new oil and gas over cleaner energy resources — “lest you suggest you’re really betting the farm on the future.”

The other side:

- **Josu Jon Imaz**, CEO of Spanish producer Repsol, responded by saying he and other CEOs must balance transitioning to cleaner sources of energy over decades with returning short-term profits for shareholders. “The real dilemma and difficulty of all these jobs is to combine both things,” Imaz said.
- **Patrick Pouyanné**, CEO of French producer Total, said cutting oil production too drastically would hurt the economy. “I don’t want to be accused in 10 years — because I would have diminished my amount of oil — for hiking the price of oil because the world will continue to need more.”

The big picture: The burning of fossil fuels oil and gas companies produce is a big reason Earth's temperature is rising, yet their products are also foundations of the global economy. Whether you love or hate them, the role these companies play is inherent to addressing climate change, particularly in the absence of U.S. presidential leadership on the issue.

The Oil and Gas Climate Initiative was officially founded four years ago, but it's just starting to do things worthy of attention.

- The first U.S. member companies — ExxonMobil, Chevron and Occidental Petroleum — joined last week. That brings the total to 13 companies, accounting for roughly a third of the world's oil and gas production.
- The companies also pledged last week to cut by one-fifth their emissions of methane, the main ingredient in natural gas that's also a potent greenhouse gas.

Each member contributes \$100 million to Climate Investments, a \$1.3 billion investment fund the group launched in November 2016. That effort has also had a slow start.

- Its CEO, Pratima Rangarajan, joined in June 2017, having previously worked on wind, solar and battery storage technologies.
- This time last year, the fund had made three investments. Today, it's at eight, with more to come, particularly on energy efficiency, according to Rhea Hamilton, who leads investment decisions.
- The fund's primary goal is to make the use of oil and natural gas as clean as possible, and also to capture carbon dioxide emitted from facilities like cement manufacturers and fossil-fuel plants.

Some environmentalists argue that the fund is just maintaining the status quo rather than transitioning to new sources of energy. To Rangarajan, its goals reflect a focus on the emissions that need to be reduced.

"I came into this job from the renewable sector," Rangarajan said at last week's event. "When I decided I was going to work on climate, I actually came to this side."

The initiative has limitations, driven by its makeup and mission.

- Its 13 member companies are a mix of publicly and government-owned companies that are natural competitors of each other. The group employs a lawyer to ensure they abide by antitrust laws.
- The group's stated mission excludes advocating for (or against) government policies like carbon prices.

Absent an overarching goal, some environmentalists say the initiative will, by design, fall far short. Fred Krupp, president of the Environmental Defense Fund, who attended last week's event, had cautious praise.

"I think each step has to be evaluated on its own merit. The first thing they started tackling when they were formed four years ago was methane, and they've taken that issue very seriously. We think they are doing good things with the billion-dollar fund. We will keep watching. We will keep encouraging."

Fred Krupp, Environmental Defense Fund President

Amy
energy reporter, Axios

202.906.9629

@AmyAHarder



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Message

From: Pagano (US), Peter A [peter.a.pagano@boeing.com]
Sent: 1/28/2019 6:53:21 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: voicemail

Hi Mandy

Hope you had a good weekend. Just left you a voicemail ...now that everyone's back was hoping to connect in the next day or two for a quick call...just like to get a sense of next steps on the aircraft standard or at the least what the timing is for deciding what they are etc... look forward to speaking with you soon...

All the best,

Peter A. Pagano
Director, Environment
The Boeing Company
703-414-6486
Email: peter.a.pagano@boeing.com

Message

From: Forman Matthew (FCA) [matthew.forman@fcagroup.com]
Sent: 9/24/2018 11:22:29 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Hearing testimony
Attachments: FCA Testimony.pdf

Hi Mandy. Attached is a copy of FCA's testimony for tomorrow's hearing in Dearborn. Please keep our testimony embargoed until 10:30 AM tomorrow. Let us know if you have any questions.

Best,
Matt

**FCA Testimony on
The Safer Affordable Fuel Efficient (SAFE) Vehicles Proposed Rule for Model Years 2021-2026**

The Dearborn Inn - Dearborn, Michigan
September 25, 2018

Good morning, I am Steve Bartoli, Vice President – Global Fuel Economy and GHG Emissions Compliance, from Fiat Chrysler Automobiles (FCA US LLC).

FCA supports continued improvements in fuel economy from today's levels, and we have been investing in fuel saving technologies across our product lineup. Some highlights at FCA include; our new family of downsized and boosted direct injection engines, implementation of wide-ratio 8 and 9 speed transmissions, the class leading Pacifica Plug-in Hybrid Electric Minivan, the introduction of 48V mild hybrids on V6 and V8 Ram Pick-ups, the application of stop-start technology across multiple products, and our announcement of a Plug-in Hybrid Electric Jeep Wrangler.

Notwithstanding FCA's investment and our competitors' similar investments in their products, 2016 marked the first time since the new standards were put in place that the industry as a whole could not comply with the fleet standards without using credits earned in previous years. That noncompliance gap – which independent IHS forecasts estimate will grow to almost 3-1/2 miles per gallon by model year 2020 – was a wake-up call that assumptions made seven years ago about the U.S. auto market need to be revisited.

Let me be very clear, FCA supports the policy choice in favor of ongoing fuel economy improvements in the fleet, but that policy needs to be based on market realities as they have evolved since 2012. In business and in government, we have to make decisions based on the best information available to us at the time, but we also must be nimble enough to adjust our plans when the facts on the ground change.

The auto market today is different from what we all – regulators and industry, alike – thought it would be in 2012. From FCA's perspective, the three most significant changes to the

assumptions we made then are: (1) sustained, lower gas prices; (2) a dramatic shift in consumer preference from cars to utility vehicles; and (3) the lack of penetration of alternative fuel technology.

First, the most significant change to the 2012 assumptions has been sustained low gas prices. In the original regulation gas prices were predicted to be over \$4 per gallon by 2018 while today's actual prices are under \$3 per gallon. When gas is relatively inexpensive, fuel economy improvements save customers less money at the pump. Consumers in turn have less incentive to pay for expensive fuel saving technology, instead choosing to invest in other features or vehicle attributes – like a more capable powertrain, a better infotainment package, or other features.

Second, the last several years have witnessed an organic shift in consumer buying patterns away from higher-fuel-economy small and midsize passenger cars toward more capable crossovers and utility vehicles. Industry and regulators clearly did not anticipate this market shift in 2012. The forecasts referenced by the agencies at that time showed cars increasing from 50% to 57% of annual vehicle sales by 2025. Instead, cars have actually dropped to 36% of the total fleet by 2017 – the opposite of the expected trend. Over the same period, utility vehicle market share has grown from 30% to over 40%.

This shift in consumer preference presents a compliance problem, even in a footprint-based standards system. A utility or crossover vehicle that has the same powertrain and technology as a sedan with the same footprint will require more energy. In a world of low gas prices, that has proven to be a trade-off that consumers are willing to make for the versatility of a crossover or SUV. But it is one of the main contributing factors to the growing industry compliance gap and it needs to be addressed in this rulemaking.

Finally, while industry is shifting more focus to electrification development, the combination of low gas prices and consumer concerns over product cost and range have inhibited uptake. The reality that residual values of electrified vehicles can be as much as 40% below those with a

conventional powertrain compounds the financial concerns for prospective consumers. Over the last decade the industry has almost tripled the number of hybrid and plug-in electric product offerings. These technologies are available across a range of vehicle types and price points. Plug-in hybrid and battery electric vehicles are eligible for significant federal tax credits and, often, state tax credits or other incentives such as High Occupancy Vehicle lanes or parking access, but they only account for 1.5% of US market share. Further, the combined U.S. market share of all hybrid and plug-in electric products has remained virtually flat at roughly 3%.

FCA continues to support working towards One National Program that allows us to build one fleet that complies with all NHTSA, EPA and ARB regulatory requirements. We agree with EPA and NHTSA that the most direct way to align the program with market realities is through adjusting the footprint curves that define a vehicle's basic fuel economy requirements. But we also recognize California's commitment to expanding electrification of the fleet. FCA is willing to work with all parties on a data-driven final rule that results in market-facing fuel economy improvements that also support greater penetration of alternative powertrains.

Thank You

Message

From: John Lundy [jlundy@capitolresourcesllc.com]
Sent: 9/19/2018 3:14:00 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: RE: EPA meeting request for Pine Belt Processing, Stonewall, MS for 9/25/18

Thanks Mandy.
 John

From: Gunasekara, Mandy [mailto:Gunasekara.Mandy@epa.gov]
Sent: Wednesday, September 19, 2018 10:12 AM
To: Susan Butler; Baptist, Erik; Beck, Nancy
Cc: John Lundy; Bolen, Derrick
Subject: Re: EPA meeting request for Pine Belt Processing, Stonewall, MS for 9/25/18

Looping in Erik and Nancy. Please see the below meeting request from Susan and John. It's next week so they are hoping to finalize the logistics as soon as possible. I hope this helps to move the meeting request along. Let me know if I can help.

Sent from my iPhone

On Sep 15, 2018, at 3:45 PM, Gunasekara, Mandy <Gunasekara.Mandy@epa.gov> wrote:

Hey Susan,
 Great to hear from you. This issue is handled through our chemicals office. The best people to meet with are Nancy Beck and Eric Baptist. I've ccd Derrick Bolen who can help work through the logistics to set up your meeting with them.
 Best,
 Mandy

Sent from my iPhone

On Sep 14, 2018, at 12:14 PM, Susan Butler <sbutler@capitolresourcesllc.com> wrote:

Hi! I hope all is well. Pine Belt Processing is a uniform supplier to the military. Ron Lack, the owner and CEO, has been working with the EPA to get etofenprox registered and approved as an insect repellent for use in both military uniforms and commercial fabrics. The initial application was for both military and commercial use...but the EPA made a mistake and only evaluated it for military. They approved it for military use in August of 2016. Subsequently, Ron has had many meetings with the EPA trying to get the commercial review completed as well, to no avail. The 4/12/17 letter provides additional background. Also attached is the actual approved label from the EPA for military use only.

Ron and my colleague John Lundy will be in DC the afternoon of 9/25/18 and would like to meet with the EPA . I would greatly appreciate you pointing us in the right direction.

By way additional background: Pending EPA Registration No.: 82392-
 G Registrant: PineBelt Processing, Inc.

Previous EPA contacts:

1. Susan Lewis, Director of Registration Division
Email: lewis.susan@epa.gov Phone: 7 [Personal Phone / Ex. 6]
2. Marietta Echeverria, Branch Chief, Vertebrate-Invertebrate Branch 1
Email: escheverria.marietta@epa.gov Phone: [Personal Phone / Ex. 6]
3. Jennifer Saunders, Project Manager for Etofenprox
Email: saunders.jennifer@epa.gov Phone: [Personal Phone / Ex. 6]

Address:

Registration Division
U.S. Environmental Protection Agency
Office of Pesticide Programs
Room S4900, One Potomac Yard
2777 South Crystal Drive
Arlington, VA 22202

Many thanks, Susan

Susan Butler
Capitol Resources, LLC
915 Prince Street
Alexandria, VA 22314
Work: 703-739-5860
Cell: 703-298-2826

<PineBelt Processing letter April 12 2017.doc>

<ETO approved LABEL PineBelt Processing.pdf>

Message

From: Shepherd, Ray [rayshepherd@peabodyenergy.com]
Sent: 9/24/2018 6:26:59 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Washington Coal Club event

Mandy—

Left you a message. Do you have time to discuss a speaking opportunity at upcoming bi-partisan Washington Coal Club event? Thanks

Ray Shepherd

Vice President and Senior Counsel, Federal Government Relations

Peabody

325 7th Street, NW, Suite 510

Washington, DC 20004

Office Phone: (202) 942-4301 | Cell: (202) 765-8680

rayshepherd@peabodyenergy.com



Message

From: Amy Harder [amy@axios.com]
Sent: 2/25/2019 10:29:36 AM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Why (and how) I cover climate change

[View this email in your browser](#)

The image shows the AXIOS logo, which consists of the word "AXIOS" in a bold, white, sans-serif font. The letter "A" is stylized with a grey, textured, triangular shape on its left side. The logo is centered on a solid black rectangular background.

<http://axios.link/XOFI>

ICYMI:

[How one Australian region kicked the coal habit](#)

Why (and how) I cover climate change

Climate change is on Washington's front-burner for the first time in a decade — on Capitol Hill, on the campaign trail and, naturally, in newsrooms.

My thought bubble: Media companies are prioritizing climate change news like never before, and that includes Axios and my own coverage. This is the story about why and how much my focus has changed over the last two years under President Trump — which is to say a heck of a lot.

The intrigue: I joined Axios in April 2017 after three years covering energy, environment and climate change at The Wall Street Journal.

- Numerous people, mainly executives, sources and others in the fossil-fuel industries, have remarked to me how much more I'm covering climate change at Axios than I was at the WSJ.

The details: Reporters often cover energy and climate change in separate silos. I am committed to a reporting track that considers the two inseparable. Of course, there are stories that don't overlap, but with time inevitably limited in life, a reporter has to focus, so that's mine. Here are the drivers of my shift over the last two years.

President Trump

- The media naturally gravitates to controversy, and Trump has made climate change more controversial than ever, given he denies there's a problem at all, is rolling back aggressive climate-change policies of his predecessor and mulling a plan to rebut mainstream climate science.
- As I wrote in [this column](#) in 2017, I believe it's our job in the media to emphasize and highlight where Trump is wrong on the science, without hyperbole.
- While President Obama at times exaggerated the impacts of climate change, he didn't go so far to reject basic science like Trump.

The science is more advanced

- I'm hesitant to make sweeping statements about extreme weather and rising global temperatures, but the scientific evidence of human-driven climate change is indeed mounting.
- A United Nations [landmark report](#) last October — punctuated by a [pair of reports](#) issued by, ironically, the Trump administration — underscored the significant repercussions global warming is already having and is increasingly going to have around the world.
- The planet is seeing more extreme weather patterns, such as wildfires and flooding, which scientists say will get worse with rising temperatures.
- This all demands more coverage by media.

Climate change is taken more seriously now

- In many ways, media is simply a reflection of society.
- Polling shows the public is increasingly acknowledging this issue and see it [as a threat](#).
- Democrats are talking about it more in Congress and on the campaign trail, which is compelling Republicans to start acknowledging it more.

- Wall Street is also starting to care about climate change, with big investors urging more transparency and action on the issue by companies.
- The World Economic Forum has ranked it — and, relatedly, extreme weather —consistently in the top of global problems for a few years running.

America's shifting energy landscape

- I got started on the energy, climate change and environment beat a decade ago, right as America's oil and natural gas boom was taking shape.
- At that time, when I was at the Washington, D.C.-based publication National Journal, I traveled the country covering the fracking boom. In Colorado, North Dakota and elsewhere I talked with locals and government officials about the impacts, both good and bad.
- We're still seeing the significant impacts of this record oil and gas production today, as Trump reminded us in his State of the Union address, but the story has — from a news perspective to be clear — matured a bit.
- In my mind, the next phase of this story looks at the long-term impacts of this energy boom, and that includes climate change.

Shifting newsroom priorities

- Newsrooms around America are ramping up coverage of climate change, including at my current job and my previous one.
- The WSJ prioritized climate change coverage less when I was there. That's starting to change: the newspaper is now running a series on the issue.

- At Axios, my editors allow wide latitude to focus on what I think is important and under-covered, ceding some of the more commodity news to the legions of other reporters and focusing on others, such as what oil and gas companies are doing in this area.

Go deeper:

- [Why climate change is the easiest news to fake](#)
- [Trump's climate denial and the power of the media](#)

Amy

energy reporter, Axios

202.906.9629

@AmyAHarder



Want to change how you receive these emails?

You can [update your preferences](#) or [unsubscribe from this list](#)

This email was sent to gunasekara.mandy@epa.gov

[why did I get this?](#) [unsubscribe from this list](#) [update subscription preferences](#)

Axios · 3100 Clarendon Blvd. · Arlington, VA 22201 · USA



Message

From: Claudia Hosky [claudia@fedinsidernews.com]
Sent: 9/27/2018 8:52:03 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Webinar on IT Modernization, Delivering on MGT Act, 10/4, 1 CPE

*Moving to the Cloud: Delivering on the MGT Act
Complimentary Video Webinar, Thurs 10/4, CPEs*

Hi Amanda,

The Modernizing Government Technology Act was signed into law in December, spurring agencies to drive transformation and meet new mandates to enhance mission effectiveness, reduce cybersecurity risk, and modernize IT for improved citizen service.

Register now for this exciting 1-hour video webinar to explore:

1. MGT Act goals, benchmarks, and vision,
2. New approaches government is taking in technology modernization through migrating to the cloud, and
3. The impact of federal cybersecurity standards on cloud adoption.

COMPLIMENTARY REGISTRATION:

https://goto.webcasts.com/starthere.jsp?ei=1212865&tp_key=f6c3d39e13&sti=JangoA

ALTERNATE LINK: www.fedinsider.com or call 202-237-0300

WEBINAR TOPIC

Moving to the Cloud: Delivering on the MGT Act

DATE: THURS, 10/4

TIME: 2:00 PM ET / 11:00 AM PT

DURATION: 1 Hour

CREDIT: 1 CPE from the George Washington University, CEPL

COST: Complimentary

DISTINGUISHED SPEAKERS

- **GARY WASHINGTON**, CIO, USDA
- **DOMINIC SALE**, Asst. Commissioner of Operations, FAS Technology Transformation Services, GSA
- **PAMELA WALKER**, VP, Federal Public Sector, IT Alliance for the Public Sector
- **MIKE WILKERSON**, Executive Director, Sales Engineering, Rubrik
- **REBECCA FITZHUGH**, Principal Technologist, Rubrik
- **FRANCIS ROSE** (Moderator), Host of Government Matters, ABC7 and WJLA 24/7 News

PRESENTED BY: FedInsider News, The George Washington University CEPL, Government Matters, and Rubrik

Can't attend, but still interested? Register now to be notified when the archive is ready. Find and register for upcoming and archived webinars at www.fedinsider.com.

Live captioning provided for accessibility for all webinars.

Looking forward to meeting you online!

Claudia M. Hosky
Publisher, FedInsider
Work: (202) 237-0300
Claudia@hosky.com

To find and register for multiple webinars at once, visit www.FedInsider.com

This email was sent by FedInsider, located at 3811 Mass. Ave. NW, Washington, DC 20016 (USA). To receive no further emails, please [click here](#) or reply to this email with "unlist" in the Subject line.

Message

From: The White House [noreply@whitehouse.gov]
Sent: 9/20/2018 7:44:18 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: RSVP Confirmation

THE WHITE HOUSE
WASHINGTON

Dear Amanda,

Thank you for submitting your RSVP. We have received your information. Please reach out to your point of contact with any questions.

Sincerely,
The White House

The White House • 1600 Pennsylvania Avenue, N.W. • Washington, D.C. 20500 • 202-456-1111

Message

From: Baer, Louis [LBaer@cement.org]
Sent: 9/20/2018 3:54:13 PM
To: Dominguez, Alexander [dominguez.alexander@epa.gov]
CC: Franklin, Charles [CFranklin@cement.org]; Derby, Rachel [RDerby@cement.org]; Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; DeLuca, Isabel [DeLuca.Isabel@epa.gov]
Subject: RE: PCA Environment & Energy Committee Meeting - October 4

Thank you Alex! I will turn the form around shortly. We look forward to hearing from Mandy.

Best,
 Louis

Louis A. Baer, Esq., CPEA
 Director/Assistant Counsel, Government Affairs
 Portland Cement Association
 1150 Connecticut Avenue NW, Suite 500
 Office: 202-719-1981
 Cell: 314-922-8041
lbaer@cement.org
www.cement.org

From: Dominguez, Alexander [mailto:dominguez.alexander@epa.gov]
Sent: Thursday, September 20, 2018 11:47 AM
To: Baer, Louis <LBaer@cement.org>
Cc: Franklin, Charles <CFranklin@cement.org>; Derby, Rachel <RDerby@cement.org>; Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>; DeLuca, Isabel <DeLuca.Isabel@epa.gov>
Subject: RE: PCA Environment & Energy Committee Meeting - October 4

Louis – Thursday, October 4th from 10:00 – 10:30 works perfectly. If you could please fill out and return the attached form that would be great. I'm also including Isabel in our communications office in case she need any additional information. Anything else just let me know.

Best,
 Alex

Alex Dominguez
 Policy Analyst to the Principal Deputy
 Office of Air and Radiation
 U.S. Environmental Protection Agency
 D: 202-564-3164
 M: 202-578-5985

From: Baer, Louis [mailto:LBaer@cement.org]
Sent: Tuesday, September 18, 2018 1:17 PM
To: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Cc: Franklin, Charles <CFranklin@cement.org>; Derby, Rachel <RDerby@cement.org>; Dominguez, Alexander <dominguez.alexander@epa.gov>
Subject: RE: PCA Environment & Energy Committee Meeting - October 4

Thank you very much Mandy! We look forward to hearing from you.

I'll coordinate with Alex on timing. Thanks.

Best,
Louis

Louis A. Baer, Esq., CPEA
Director/Assistant Counsel, Government Affairs
Portland Cement Association
1150 Connecticut Avenue NW, Suite 500
Office: 202-719-1981
Cell: 314-922-8041
lbaer@cement.org
www.cement.org

From: Gunasekara, Mandy [<mailto:Gunasekara.Mandy@epa.gov>]
Sent: Tuesday, September 18, 2018 1:09 PM
To: Baer, Louis <LBaer@cement.org>
Cc: Franklin, Charles <CFranklin@cement.org>; Derby, Rachel <RDerby@cement.org>; Dominguez, Alexander <dominguez.alexander@epa.gov>
Subject: Re: PCA Environment & Energy Committee Meeting - October 4

Hi Louis,
I'd be happy to speak to the group. I'm ccing Alex to help with the logistics.
Best,
Mandy

Sent from my iPhone

On Sep 18, 2018, at 10:44 AM, Baer, Louis <LBaer@cement.org> wrote:

Mandy,

I am following up on our invitation last week to speak at PCA's Environment & Energy Committee Meeting on Thursday, October 4. Our meeting will take place at the National Association of Manufacturers (733 10th St. NW 7th Floor). Please let us know if you available that day for 30 minutes and our group would love to hear you speak on the current priorities and progress you are making at the Office of Air & Radiation. Thank you!

Best,
Louis

Louis A. Baer, Esq., CPEA
Director/Assistant Counsel, Government Affairs
Portland Cement Association
1150 Connecticut Avenue NW, Suite 500
Office: 202-719-1981
Cell: 314-922-8041
lbaer@cement.org
www.cement.org

From: Baer, Louis
Sent: Monday, September 10, 2018 4:25 PM
To: 'gunasekara.mandy@epa.gov' <gunasekara.mandy@epa.gov>
Cc: Franklin, Charles <CFranklin@cement.org>; Derby, Rachel <RDerby@cement.org>
Subject: PCA Environment & Energy Committee Meeting - October 4

Mandy,

We hope you are doing well and having a great summer. Thank you again for meeting with us and our members in April to discuss the air issue priorities for the cement industry.

PCA's Fall Environment & Energy Committee Meeting is being held here in D.C. at the National Association of Manufacturers (733 10th St. NW) on Thursday, October 4 and we would like to invite you to speak to our members. Our members would be very interested to hear further about the progress you and your colleagues at the Office of Air & Radiation are making on various air issues, such as the NAAQS and the recently proposed Affordable Clean Energy Rule.

Are you available to speak to our members at 10 AM on Thursday, October 4 for 30 minutes? The Environment & Energy Committee Meeting will have around 30-35 people and consist of senior environmental and government affairs leaders at our member companies. Our schedule is flexible so if there is a better time on Thursday, October 4, we can accommodate your schedule.

Please let us know if you are available to speak. We look forward to hearing from you.

Best,
Louis

Louis A. Baer, Esq., CPEA
Director/Assistant Counsel, Government Affairs
Portland Cement Association
1150 Connecticut Avenue NW, Suite 500
Office: 202-719-1981
Cell: 314-922-8041
lbaer@cement.org
www.cement.org

Message

From: Will Hupman [HupmanW@api.org]
Sent: 9/12/2018 4:36:56 PM
To: Dominguez, Alexander [dominguez.alexander@epa.gov]
CC: Frank Macchiarola [MacchiarolaF@api.org]; Patrick Kelly [kellyp@api.org]; Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Re: meeting request in re E15 waiver

Thank you, Alex. We'll look forward to seeing you tomorrow. Will

Will Hupman
Director – Federal Relations
American Petroleum Institute
office: [202-682-8396](tel:202-682-8396)
cell: [202-615-7192](tel:202-615-7192)
hupmanw@api.org

On Sep 12, 2018, at 11:58 AM, Dominguez, Alexander <dominguez.alexander@epa.gov> wrote:

Will -

You are confirmed for a meeting on Thursday, September 13th at 1:45 with Mandy Gunasekara and Alex Dominguez.

Directions and procedures to 1200 Pennsylvania Avenue NW:

Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

Taxi: Direct the taxi to drop you off on 12th Street NW, between Constitution and Pennsylvania Avenues, at the elevator for the Federal Triangle metro stop - this is almost exactly half way between the two avenues on 12th Street NW. Facing the building with the EPA logo and American flags, walk toward the building and take the glass door on your right hand side with the escalators going down to the metro on your left – that is the North Lobby of the William Jefferson Clinton building.

Security Procedures: A government issued photo id is required to enter the building and it is suggested you arrive 15 minutes early in order to be cleared and arrive at the meeting room on time. Upon entering the lobby, the meeting attendees will be asked to pass through security and provide a photo ID for entrance. If you are a foreign national entering on a non-US passport, please let us know in advance, as there is a separate clearance process.

Upon arrival, let the guards know that you were instructed to call 202-564-7404 for a security escort.

Feel free to contact me should you need any additional information.

Alex Dominguez
Policy Analyst to the Principal Deputy

Office of Air and Radiation
U.S. Environmental Protection Agency
D: 202-564-3164
M: 202-578-5985

From: Will Hupman [<mailto:HupmanW@api.org>]
Sent: Wednesday, September 12, 2018 11:36 AM
To: Dominguez, Alexander <dominguez.alexander@epa.gov>; Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Cc: Frank Macchiarola <MacchiarolaF@api.org>; Patrick Kelly <kellyp@api.org>
Subject: RE: meeting request in re E15 waiver

Thank you, Alex. We have a meeting at the EEOB tomorrow at 3 pm. Could we start a little earlier, at 1:45 pm, to be sure we have enough time? Attendees would be Frank Macchiarola, Patrick Kelly, and myself, all from API. Please let me know what else you need on our end. Thanks, Will

Will Hupman
Director – Federal Relations | American Petroleum Institute
office: 202-682-8396 | cell: 202-615-7192 | hupmanw@api.org

From: Dominguez, Alexander <dominguez.alexander@epa.gov>
Sent: Wednesday, September 12, 2018 11:29 AM
To: Will Hupman <HupmanW@api.org>; Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Cc: Frank Macchiarola <MacchiarolaF@api.org>
Subject: RE: meeting request in re E15 waiver

Hey Will – Does tomorrow (9/13) from 2:00 – 2:45 work?

Alex Dominguez
Policy Analyst to the Principal Deputy
Office of Air and Radiation
U.S. Environmental Protection Agency
D: 202-564-3164
M: 202-578-5985

From: Will Hupman [<mailto:HupmanW@api.org>]
Sent: Tuesday, September 11, 2018 2:16 PM
To: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Cc: Dominguez, Alexander <dominguez.alexander@epa.gov>; Frank Macchiarola <MacchiarolaF@api.org>
Subject: meeting request in re E15 waiver

Hi Mandy and Alex – I'm reaching out to see if you may have a few minutes soon for Frank Macchiarola, API Downstream Director, and myself to come in and chat on the RVP waiver for E15 issue? We wanted to hear your latest thinking and hopefully share our perspective.

We'll obviously work around your schedule, but to get the ball rolling the following days are good on our end: Thursday afternoon (9/13), all day Friday, next Tuesday (9/18), Wednesday afternoon (9/19), Thursday afternoon (9/20), and all day Friday (9/21).

Thank you! Will

Will Hupman
Director – Federal Relations | American Petroleum Institute

office: 202-683-8398 | cell: 202-615-7192 | hupmanw@epa.org

Message

From: Chancellor, Erin [chancellor.erin@epa.gov]
Sent: 9/28/2018 9:46:45 PM
Subject: I'm off to Texas!

Hi y'all,

Today is not only the 8 month anniversary of my EPA start date, but it's also my last day at HQ. I'm staying in the EPA fam and heading to Region 6 to be Anne's Chief of Staff, so no need to be too broken up over my departure- you'll still get to (/have to?) hear from me.

It's been a pleasure working with all of you here in DC, and I'll miss seeing you all around the building. If you're ever in Region 6 or the great state of Texas, please give me a shout (*note: you should know that if you come to Dallas and don't tell me, I will find out and I will be offended*).

My numbers will change, but you can always get me at Personal Phone / Ex. 6 and this email will stay the same.

Have a great weekend!

Erin E. Chancellor
Chief of Staff | Office of the Regional Administrator
U.S. EPA Region 6
chancellor.erin@epa.gov

Message

From: John Lundy [jlundy@capitolresourcesllc.com]
Sent: 9/20/2018 3:43:49 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Susan Butler [sbutler@capitolresourcesllc.com]; Baptist, Erik [Baptist.Erik@epa.gov]; Beck, Nancy [Beck.Nancy@epa.gov]
CC: Bolen, Derrick [bolen.derrick@epa.gov]; Ty Mabry [tmabry@capitolresourcesllc.com]; Adair Cunningham [acunningham@capitolresourcesllc.com]
Subject: RE: EPA meeting request for Pine Belt Processing, Stonewall, MS for 9/25/18

Looks like we need to look at another date for a possible meeting. Ron Lack/Pine Belt Processing has multiple meetings next week with the Army on using Etopenprox on military uniforms. We would, however, like to get a couple of dates in the upcoming weeks that would work with your schedules.

If you could provide me with a contact, I will reach out to them and work on a date that is convenient.

Thanks again.

John Lundy

From: Gunasekara, Mandy [mailto:Gunasekara.Mandy@epa.gov]
Sent: Wednesday, September 19, 2018 10:12 AM
To: Susan Butler; Baptist, Erik; Beck, Nancy
Cc: John Lundy; Bolen, Derrick
Subject: Re: EPA meeting request for Pine Belt Processing, Stonewall, MS for 9/25/18

Looping in Erik and Nancy. Please see the below meeting request from Susan and John. It's next week so they are hoping to finalize the logistics as soon as possible. I hope this helps to move the meeting request along. Let me know if I can help.

Sent from my iPhone

On Sep 15, 2018, at 3:45 PM, Gunasekara, Mandy <Gunasekara.Mandy@epa.gov> wrote:

Hey Susan,
 Great to hear from you. This issue is handled through our chemicals office. The best people to meet with are Nancy Beck and Eric Baptist. I've ccd Derrick Bolen who can help work through the logistics to set up your meeting with them.

Best,
 Mandy

Sent from my iPhone

On Sep 14, 2018, at 12:14 PM, Susan Butler <sbutler@capitolresourcesllc.com> wrote:

Hi! I hope all is well. Pine Belt Processing is a uniform supplier to the military. Ron Lack, the owner and CEO, has been working with the EPA to get etopenprox registered and approved as an insect repellent for use in both military uniforms and commercial fabrics. The initial application was for both military and commercial use...but the EPA made a mistake and only evaluated it for military. They approved it for military use in August of 2016. Subsequently, Ron has had many meetings with the EPA trying to get the commercial review completed as well, to no avail. The 4/12/17 letter provides additional background. Also attached is the actual approved label from the EPA for military use only.

Ron and my colleague John Lundy will be in DC the afternoon of 9/25/18 and would like to meet with the EPA . I would greatly appreciate you pointing us in the right direction.

G By way additional background: Pending EPA Registration No.: 82392-
Registrant: PineBelt Processing, Inc.

Previous EPA contacts:

1. Susan Lewis, Director of Registration Division
Email: lewis.susan@epa.gov Phone: 703-308-8009
2. Marietta Echeverria, Branch Chief, Vertebrate-Invertebrate Branch 1
Email: escheverria.marietta@epa.gov Phone: 703-305-8578
3. Jennifer Saunders, Project Manager for Etofenprox
Email: saunders.jennifer@epa.gov Phone: 703-347-0156

Address:

Registration Division
U.S. Environmental Protection Agency
Office of Pesticide Programs
Room S4900, One Potomac Yard
2777 South Crystal Drive
Arlington, VA 22202

Many thanks, Susan

Susan Butler
Capitol Resources, LLC
915 Prince Street
Alexandria, VA 22314
Work: 703-739-5860
Cell: 703-298-2826

<PineBelt Processing letter April 12 2017.doc>

<ETO approved LABEL PineBelt Processing.pdf>

Message

From: Armentrout, Clay (Shelby) [Clay_Armentrout@shelby.senate.gov]
Sent: 9/19/2018 10:11:51 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: RE: Gliders

I am out on Friday, but no rush at all! Does next Monday or another day that week work?

Thank you!

From: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Sent: Tuesday, September 18, 2018 4:56 PM
To: Armentrout, Clay (Shelby) <Clay_Armentrout@shelby.senate.gov>
Subject: Re: Gliders

Hey Clay,
Yes. I'm in Canada until Thursday- does Friday work? Or if you need to talk sooner, I can find time on Thursday. Let me know.

Sent from my iPhone

On Sep 18, 2018, at 4:42 PM, Armentrout, Clay (Shelby) <Clay_Armentrout@shelby.senate.gov> wrote:

Hey Mandy, I hope all is well. Do you have a quick minute to discuss sometime in the near future?

Best,
Clay

Clay Armentrout
Legislative Counsel
Office of Senator Richard Shelby (R-AL)
304 Russell Senate Office Building
202-224-5744

Message

From: Jeff Sadosky [jsadosky@forbes-tate.com]
Sent: 1/29/2019 3:28:15 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
CC: Hengst, Benjamin [Hengst.Benjamin@epa.gov]; Dominguez, Alexander [dominguez.alexander@epa.gov]
Subject: NMMA and OPEI comments following up on E-15 education
Attachments: Complete OPEI_NMMA E15 Comments[1].pdf

Mandy,

Hope you all are doing OK and digging out from the shutdown. When we last met with your team, we had discussed more formal comments from NMMA about what could be done regarding education around the year-round E-15 change. To that end, I wanted to send the attached comments to you from NMMA and the Outdoor Power Equipment Institute (OPEI). Also, as this is ahead of the formal comment period around rule-making, I wanted to ask if there's a formal channel through which this must be submitted or not. If so, please let me know and we'll be sure to move it through appropriate channels.

Thanks, please let me know if there's anything we can do to help.

Best,
Jeff

Jeffrey C. Sadosky
Forbes Tate Partners
777 6th Street NW
8th Floor
Washington, DC 20001
(202) 340-8586 cell

Joint Comments on E15 Education and Outreach

January 29, 2019

To: U.S. Environmental Protection Agency
Office of Transportation and Air Quality
2000 Traverwood Drive
Ann Arbor, MI 48105

Re: Modifications to Fuel Regulations to Provide Flexibility for E15; RIN 2060-AU34

The Outdoor Power Equipment Institute (OPEI) and the National Marine Manufacturers Association (NMMA) appreciate the opportunity to provide background information on the need for EPA to strengthen its Misfueling Mitigation Program (MMP) at the same time the agency proposes to allow fuel containing 15 percent ethanol (E15) to be sold year-round.

OPEI is an international trade association representing the manufacturers and their suppliers of small engines, utility vehicles, personal transport vehicles, golf cars and consumer and commercial outdoor power equipment. These products are commonly found in most American households and include products such as lawnmowers, garden tractors, trimmers, edgers, chain saws, snow throwers, tillers, leaf blowers, generators, and power washers. While small engines and outdoor power equipment consume a small percentage of the nation's fuel supply, their ownership by the American consumer is ubiquitous. Additionally, many of these same products are made for commercial use by contractors, farmers, utility crews, parks and recreation, states and municipalities, and fire and emergency rescue personnel. Many of these products have long service lives which can exceed a decade, resulting in an estimated 250 million legacy products currently in use. Our industry contributes approximately \$16 billion to annual U.S. GDP and employs some 150,000 people across 50 states.

NMMA is the leading recreational marine industry trade association in North America, representing 1,500 boat, engine, and accessory manufacturers. NMMA members collectively produce more than 80 percent of the recreational marine products sold in the

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United States. Recreational boating is a significant driver of the country's economy, employing 691,000 people across more than 35,000 boating businesses, while contributing \$170 billion in economic activity. What's more, 142 million recreational boaters take to the water annually in the U.S., consuming about 2.1 billion gallons of gasoline.

EPA's modifications to existing fuel regulations to allow E15 to be sold year-round are deeply concerning to the outdoor power equipment and recreational boating industries, due to the negative impact of higher-ethanol blend fuels on outdoor power equipment, marine engines and vessels, and consumers. E15 is not approved for use in these non-road engines¹ and EPA has established a Misfueling Mitigation Program (MMP) to reduce the likelihood of E15 blend fuels from being used in engines for which that fuel is not approved.² However, as OPEI and NMMA have each explained in detailed comments submitted to the agency on previous rulemakings, additional mechanisms are required to fully prevent misfueling of non-road engines. Without a more comprehensive misfueling mitigation program in place, expanding the availability of E15 will significantly increase the risk of damage to non-road engines. OPEI and NMMA therefore request that EPA include in its proposal measures to address the continued need for robust consumer education and outreach on E15 usage and impacts on non-road engines. These comments address the need for such additional education and outreach and also provide suggested preamble language that could be included in the agency's notice of proposed rulemaking.

Use of E15 and Higher Ethanol Blends Fuels in Non-Road Engines will Damage those Engines and Cause Harm to Manufacturers and Consumers

Use of E15 in non-road engines has both adverse environmental and economic consequences. The additional oxygen content of higher ethanol blend fuels produces a significant increase in engine temperatures that results in increased engine wear and ultimately engine failure. Further, the increased amount of ethanol causes increased corrosion of both metallic and rubber and plastic components. This in turn leads to

¹ 75 Fed. Reg. 68,094 (Nov. 4, 2010).

² 40 C.F.R. Part 80, Subpart N—Additional Requirements for Gasoline-Ethanol Blends.

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performance degradation, emission increases, engine failure, and potential fuel leaks as rubber and plastic components no longer form a complete seal. Based on studies conducted in conjunction with the U.S. Department of Energy, use of E15 in marine engines results in emissions increases outside of EPA certification limits, increased fuel consumption, and damage severe enough to prevent engines from completing the EPA durability testing process.³ Testing conducted on small non-road engines also identified problems related to E15 use, including leaner engine operation, higher operating temperatures, higher operating speed, and unintentional clutch engagement.⁴ Based on these studies and others, EPA has prohibited the use of E15 in small off-road engines, such as those used in lawnmowers, tractors, utility vehicles, trimmers, chain saws, and other lawn and garden equipment. EPA also prohibited the use of E15 in marine engines and other non-road equipment.⁵ Attached to these comments are additional materials previously provided to EPA regarding the effects of E15 and other ethanol blends on non-road engines. Increasing the availability of E15 likewise increases the risk that consumers will choose the wrong fuel for use in their non-road products, increasing the economic and environmental harms from misfueling of non-road engines. For marine engines, the potential for engine failure due to use of E15 presents the additional safety risk of leaving boaters stranded on the water.

Recent Polling Data Suggests that Widespread Consumer Confusion Continues Regarding the Use of E15 and other Ethanol Blends in Non-Road Engines.

Even though EPA has prohibited the use of E15 in non-road engines, misfueling continues and consumers remain confused about the fuels that are appropriate for use in their non-road and marine engines. A Harris Poll conducted in 2018 on behalf of OPEI concluded that more consumers are using the wrong type of fuel in their products. In 2018, 11% of those surveyed reported using E15, E30, E50, or E85 to fuel their equipment, up from 7% in 2015. The study found that Americans are more likely now

³<http://www.nmma.org/assets/cabinets/Cabinet515/Marine%20Biobutanol%20Research%20Book%20SFS2.compressed.pdf>

⁴ See, e.g., Comments of Dr. Ron Sahu on “Effects of Intermediate Ethanol Blends on Legacy Vehicles and Small Non-Road Engines, Report 1 – Updated.” NREL/TP-540-43543 and ORNL/TM-2008/117, Feb. 2009

⁵ See 75 Fed. Reg. 68,094.

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than in years past to believe higher ethanol blends of gasoline are safe for any gasoline (i.e., non-diesel) engine (38% in 2018 vs. 31% in 2017, 31% in 2016, and 30% in 2015). The Harris Poll also found that only 20% of consumers, down from 25% in 2017, say they notice the ethanol content at a gas pump. When asked about the label required under the current EPA MMP, more than 3 in 5 Americans (63%) feel it is inadequate to inform consumers about E15 fuel being illegal to use in outdoor power equipment.

Outdoor power equipment products are also unique because they are often fueled from portable containers, which are typically fueled at the same time and location as the vehicle used to transport the container from the filling station to the off-road equipment location. In fact, many types of non-road products, including lawn, garden, and forestry products and off-road vehicles like ATVs and utility vehicles, are exclusively refueled from portable containers. Portable fuel containers have a range of opening sizes for refilling the container and any fuel dispensing nozzle that could be utilized to fill a vehicle can also be used to fill the portable container. Current pump labels may be effective in preventing misfueling of vehicles at the time of fueling, but may not clearly communicate the risk of using that same fuel to fill a portable container that will later be used to refuel nonroad equipment.

The fueling of boats also presents unique challenges. Approximately 95% of recreational boats are less than 26 feet in length and are capable of being—and often are—transported by trailer to water bodies. The vast majority of these boats are fueled at retail gas stations when being towed behind vehicles, rather than fueled at marinas. The risk of misfueling with E15 is therefore high, particularly if fuel pumps are not clearly labeled regarding ethanol content or effectively warn customers that E15 should not be used in marine engines.

The images in Attachment 1 ⁶show examples of current pump configurations and labeling. The sheer number of labels on these fuel pumps makes the ethanol content and warning labels difficult to locate and even more difficult to comprehend, particularly in

⁶ <https://spaces.hightail.com/space/dqYb9hZhQf>

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the few seconds consumers may spend deciding on the grade or type of fuel to purchase. As these photos show, label location also differs from pump to pump, so consumers cannot always expect to look to a standard location on the fuel pump to determine the ethanol content of a fuel before making purchasing decisions. Even if the current E15 warning label alone were sufficient to deter misfueling, the lack of standardized label placement and frequent placement above or below eye level or behind hoses significantly reduces its effectiveness. The photos in Attachment 1 also depict the advertisement of “Unleaded 88” fuel, which contains 15 percent ethanol but is labeled to appear to be an 88 octane gasoline. Although pumps dispensing “Unleaded 88” also carry the current E15 warning label, the signage and display of the fuel is confusing and misleading to customers. These changes in fuel marketing strategies and continuing consumer confusion about appropriate fuels for their vehicles and engines merit careful review by EPA and the establishment of a more robust misfueling mitigation program.

Industry Efforts to Educate Consumers about Fuel Choices are Effective but Must Be Supplemented with EPA Action and a Stronger Misfueling Prevention Program

In 2013, OPEI, in partnership with NMMA, launched a “Look Before You Pump” program. Both organizations have used “Look Before You Pump” materials and messaging with local and national dealers, service, and retail outlets to communicate the importance of using only approved fuels in non-road engines. NMMA has also partnered with boating safety and certification organizations, state boating associations, and national groups like BoatUS and the American Sportfishing Association to increase awareness about the need to use E0 or E10 fuel in marine engines. OPEI and NMMA have worked diligently for five years to raise awareness among outdoor power equipment and marine engine manufacturers, dealers, retail outlets, and owners about proper fueling. Despite this lengthy and concerted campaign, the polling data cited above demonstrates that industry efforts and the current EPA MMP are not sufficient to ensure that consumers are fully aware of the risks of fueling their non-road products with E15.

EPA also has a legal obligation to prevent use of E15 in engines for which the fuel is not approved. Under section 211(f) of the Clean Air Act (CAA), EPA may only waive the

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prohibition against the introduction into commerce of any fuel after the agency concludes that the fuel or fuel additive will not cause or contribute to engines or equipment failing to meet applicable emission standards over their useful life. Further, CAA section 211(c)(1) allows EPA to control the introduction into commerce, offering for sale, or sale of any fuel or fuel additive if such fuel or fuel additive, or any emission product of such fuel or fuel additive, causes or contributes to air pollution that endangers public health or welfare, or will impair the performance of an emission control device or system that is in general use. It is under these two provisions that EPA first issued the original MMP.⁷ The same two provisions obligate EPA to consider whether additional controls on the sale, or offering for sale, of E15 are necessary to ensure that use of the fuel does not cause or contribute to air pollution or impair the performance of emission control systems. Based on the polling data summarized above and provided in full in Attachment 2, the current MMP and industry stakeholder efforts are insufficient to mitigate against misfueling to the fullest extent practicable. Therefore, EPA must develop a broad outreach effort to increase consumer knowledge of the economic harm and environmental impacts that can result from use of E15 in outdoor power equipment and marine engines.

Misfueling of Marine and Outdoor Power Equipment Engines Causes Economic Harm to Consumers

The polling cited above found that consumers are increasingly using fuels with more than 10 percent ethanol to fuel their marine engines and outdoor power equipment. The result of misfueling is engines that perform poorly, or not at all, and which can pose safety risks to the user. An engine destroyed by use of E15 means that industries and individuals who rely on lawn and garden equipment, chain saws, snow blowers, and tillers may have equipment out of service; contractors, farmers, utility crews, parks and recreation departments, landscapers, states and municipalities, and fire crews may be unable to work if their equipment is not functioning. Because misfueling voids the manufacturer's warranty, the cost of replacing equipment damaged by E15 is entirely borne by the consumer. Many of these products can have service lives of up to 10 years or more if properly maintained but the cost of early replacement due to misfueling can have

⁷ 75 Fed. Reg. 44,406, 44,410 (July 25, 2011).

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significant economic consequences to individual consumers and to industries that rely on outdoor power equipment to perform their functions.

In the boating industry, approximately 64% of boat owners have annual household incomes below \$100,000. Replacing an engine that is damaged by E15 use can cost the consumer several hundred to several thousand dollars. Again, use of E15 voids the manufacturer's warranty so the entire cost of misfueling is shouldered by the consumer.

If E15 is permitted to be sold year-round, the rate of misfueling is likely to increase, along with the economic impact on the public. The economic costs of misfueling, and the need to protect consumers from the expense of replacing engines and equipment damaged by E15 use, weigh heavily in favor of a more comprehensive misfueling mitigation plan and increased customer awareness of the risks of E15 use. A coordinated effort by *all* stakeholders—including EPA—to educate consumers about the need to carefully select the fuel used in marine engines and outdoor power equipment is required.

Specific Recommendations for Reducing Misfueling and Improving Consumer Awareness about E15

First, EPA should request comment on whether changes should be made to the E15 label currently in use on fuel pumps dispensing that fuel. Specifically, NMMA and OPEI recommend that EPA request comment on whether the size, design, or other characteristics of the label should be changed to more clearly communicate the fuel's ethanol content to consumers. NMMA and OPEI also recommend that EPA request comments on the placement of labels in order to maximize the effectiveness of the label and increase consumer awareness of the fuel's ethanol content. EPA should also request comments on whether E15 pump labels should carry warnings in languages other than English in order to more broadly communicate the risk of fueling nonroad engines with E15. Additionally, EPA should also seek comment on whether specific changes are necessary to the labels used on E85, blender pumps, and pumps dispensing midlevel ethanol blend fuels, as well as labels for pumps dispensing E0 and E10 fuels.

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Second, EPA should request comment on whether to require physical barriers to be implemented that would reduce the risk of misfueling of engines for which the use of E15 is not approved. Specifically, NMMA and OPEI recommend that EPA request comment on whether to require fuel pumps dispensing E15 or higher-ethanol blends to be equipped with a key pad approval system that would be tied to payment method or fuel grade selection. A keypad system is NMMA and OPEI's preferred approach to a physical barrier to prevent misfueling. This system could require the consumer to confirm that she or he understands that the fuel contains more than 10% ethanol and cannot be legally used in non-road products due to the risk of substantial damage and/or voiding warranty coverage. In the 2011 MMP, EPA concluded that information available at that time did not support the adoption of a keypad or touch screen information display or confirmation requirement. However, due to the expanded availability of E15 and the likely increase in sale of E15 due to the recent RVO increases, this option is likely to be more cost-effective and feasible than when E15 volumes were significantly lower. OPEI and NMMA therefore recommend that EPA request comments on the potential cost of implementing such systems as well as the effectiveness in preventing misfueling of non-road engines. We recognize that implementing a keypad verification system imposes costs on fuel retailers. However, engine damage and replacement imposes significant costs on consumers that can be avoided if robust barriers are put in place to prevent misfueling in the first place.

NMMA and OPEI also recommend that EPA request comments on whether to consider adopting a different fuel pump nozzle size for those pumps dispensing E15. EPA previously rejected a different-sized nozzle as not feasible.⁸ However, at the time of the original MMP, EPA anticipated that the transition to E15 would take time and would not immediately be available across the country.⁹ Considering the current broad availability of E15 and the agency's intent to allow E15 to be sold year-round, EPA must reconsider whether physical barriers to use of E15 in engines for which use of that fuel is not approved would now be a more cost-effective solution to preventing misfueling. NMMA

⁸ See 75 Fed. Reg. at 44, 426.

⁹ *Id.*

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and OPEI recognize that requiring different-sized nozzles for E15 comes at a cost to fuel retailers. However, we strongly recommend that EPA balance the cost of implementing physical barriers to misfueling with the costs to consumers of replacing marine engines and outdoor power equipment due to damage from misfueling. The economic impact on fuel retailers alone should not be the only factor in determining whether physical barriers are a feasible option.

In addition, NMMA and OPEI recommend that EPA consider whether to require dedicated fuel pumps dispensing only fuels containing 10 percent or less ethanol. We believe that this is the only option that will completely mitigate against misfueling. Beyond the new products being sold each day, OPEI also estimates as many as 250 million legacy products owned by U.S. households and businesses, all of which require gasoline with no more than 10% ethanol to run properly and safely. It is also important to note that many of the commercial-grade and higher price point products manufactured by our members will likely be in service for decades to come. Similarly, recreational boats are designed and built to be used for decades. While newer marine engines are designed to operate on E10, approximately 16 million legacy marine engines remain in use that will be harmed by higher-ethanol blends. We therefore recommend that EPA propose to require the continued sale of E10 and E0 fuels, as well as require fuel retailers to maintain a dedicated pump for E0 or E10 gasoline.

Finally, NMMA and OPEI also recommend that EPA seek comment on other misfueling mitigation strategies that were deemed to have benefits outweighed by cost in the 2011 MMP final rule. Among these options were distinctive fuel pump hand warmers for E15 dispensers and RFID technologies.¹⁰ OPEI and NMMA recommend that EPA also request comment on any other measures that would reduce the risk of misfueling and increase customer awareness of the harm E15 poses to non-road engines.

Proposed Preamble Language on Consumer Education and Pump Labeling Requirements

¹⁰ 75 Fed. Reg. at 44,426-427.

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NMMA and OPEI respectfully provide the sample preamble language that could be included in EPA's notice of proposed rulemaking to explain the rationale for revising the MMP and solicit comment on what measures would be effective in increasing customer awareness of the risks of misfueling.

In 2010 and 2011, EPA determined that the use of E15 in some small engines will damage those engines and equipment.¹¹ EPA denied the E15 waiver request for non-road engines, vehicles, and equipment on the basis that “there are emission related concerns with the use of E-15 in non-road products, particularly regarding long-term exhaust and evaporative emission (durability) impacts and material compatibility issues.”¹²

Following the partial waiver prohibiting the use of E15 in these types of engines and equipment, EPA issued a misfueling mitigation rule.¹³ In this rule, EPA recognized its concerns with misfueling E15 into non-road products “include the potential for elevated exhaust and evaporative emissions, as well as the potential for emissions impacts related to engine failure from overheating.”¹⁴ We concluded that these emission related problems could potentially occur with enough frequency that the avoided emissions increases from reduced or prevented misfueling would more than outweigh the relatively low cost imposed by the required misfueling mitigation regulations.¹⁵ Therefore, the potential emission increases from misfueling supported the establishment of the original misfueling mitigation plan, even though a very low percentage of engines and products might experience misfueling or an increase in emissions.

At the time of the MMP, we anticipated that the introduction of E15 into the marketplace would likely start in a limited number of areas and grow over time before becoming broadly available. We also recognized that a public outreach

¹¹ 75 Fed. Reg. 68,094 (Nov. 4, 2010); 76 Fed. Reg. 4662 (Jan. 26, 2011).

¹² 75 Fed. Reg. 68,094, 68,137.

¹³ 76 Fed. Reg. 44,406 (July 25, 2011).

¹⁴ 76 Fed. Reg. at 44,409..

¹⁵ *Id.*

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campaign, in partnership with stakeholders, would be crucial to understanding how E15 would be distributed, sold, and used, and would provide a forum for identifying and resolving issues that developed as E15 moved into the marketplace.

Now that we are proposing to allow the sale of E15 year-round, EPA requests comments on whether EPA should adopt a more robust set of consumer education and pump labeling requirements. Effective outreach to consumers is essential to the successful extension of the year-round availability of E15 without increasing misfueling of those engines and equipment for which E15 use is not approved. Outreach to consumers is critical to help mitigate misfueling incidents that can result in increased emissions or vehicle or engine damage.

EPA recognizes concerns raised by industry stakeholders that the current misfueling mitigation plan may not be adequate to prevent misfueling of all engines for which the use of E15 is not approved. A Harris Poll conducted in 2018 on behalf of industry stakeholders concluded that misfueling of nonroad engines is increasing, rather than decreasing. According to stakeholder polling data, in 2018, 11% of those surveyed reported using E15, E30, E50, or E85 to fuel their equipment, up from 7% in 2015. The study found that Americans are more likely now than in years past to believe higher ethanol blends of gasoline are safe for any gasoline (i.e., non-diesel) engine (38% in 2018 vs. 31% in 2017, 31% in 2016, and 30% in 2015). The Harris Poll also found that only 20% of consumers, down from 25% in 2017, say they notice the ethanol content at a gas pump. When asked about the label required under the current EPA MMP, more than 3 in 5 Americans (63%) feel it is inadequate to inform consumers about E15 fuel being illegal to use in outdoor power equipment.

Because the use of a non-approved fuel voids the manufacturer's warranty, the cost of misfueling of marine engines and outdoor power equipment is primarily borne by the public. Beyond the cost of replacing engines that are damaged or

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destroyed by E15, misfueling can have broader economic impacts. Outdoor power equipment, including lawn mowers, tractors, chain saws, and generators are used by a variety of industries, including landscapers, farmers, contractors, parks and recreation departments, and fire crews. Inoperable equipment may mean that individuals and companies may be temporarily out of work or unable to perform certain jobs. Marine engines damaged by E15 also are not covered by the manufacturer's warranty, so the consumer bears the cost of replacement. Because of these economic impacts, EPA believes that amending the current MMP is required.

First, EPA requests comment on whether changes should be made to the E15 label currently in use on fuel pumps dispensing that fuel. Specifically, EPA requests comment on whether the size, design, or other characteristics of the label should be changed to more clearly communicate the fuel's ethanol content to consumers. EPA also requests comments on the placement of labels in order to maximize the effectiveness of the label and increase consumer awareness of the fuel's ethanol content. EPA also requests comments on whether E15 pump labels should carry warnings in languages other than English in order to more broadly communicate the risk of fueling nonroad engines with E15.

In addition to labels on E15 pumps, EPA also seeks comment on whether E85, blender pumps, and mid-level ethanol blend pumps should have labels indicating that such fuels should not be used in nonroad engines. As with the E15 label, EPA seeks comment on the size, design, language, placement on pumps, and other characteristics of the label that would clearly communicate the fuel's ethanol content and the engines in which the fuel is authorized for use.

Second, EPA requests comment on whether we should require physical barriers to be implemented that would reduce the risk of misfueling of engines for which the use of E15 is not approved. Specifically, EPA requests comment on whether we should require fuel pumps dispensing E15 or higher-ethanol blends to be

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equipped with a key pad approval system that would be tied to payment method or fuel grade selection. This system could require the consumer to confirm that she or he understands that the fuel contains more than 10% ethanol and cannot be legally used in non-road products due to the risk of substantial damage and/or voiding warranty coverage. EPA requests comment on the potential cost of implementing such systems as well as the effectiveness in preventing misfueling of non-road engines.

In addition, EPA requests comments on whether we should consider adopting a different fuel pump nozzle size for those pumps dispensing E15. In the past, EPA concluded that requiring a different nozzle size for pumps dispensing E15 was not a cost-effective method of preventing misfueling in light of the relatively slow and region-by-region adoption of E15 fuels. We seek comment on whether the year-round availability of E15 will significantly increase the risk of misfueling to the point that implementing differently-sized fuel pump nozzles would now be a cost-effective method of preventing misfueling.

Third, EPA requests comment on the type of public outreach and consumer education program, beyond fuel pump labeling and physical barriers, that would be effective in mitigating misfueling. EPA also requests comments on the appropriate stakeholders that should be involved in the development of this agency-led outreach effort. In the context of this program, potential key stakeholders include ethanol producers, fuel manufacturers, automobile, engine and equipment manufacturers, States, non- governmental organizations, parties in the fuel distribution system, EPA, DOE, and USDA. EPA requests comment on potential education and outreach activities a public/private group could undertake, include serving as a central clearinghouse for technical questions about E15 and its use, promoting best practices to educate consumers or mitigate misfueling instances, and developing educational materials and making them available to the public.

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In comments on EPA's MMP, some stakeholders suggested that a Web site be created to inform consumers of the potential impacts of E15 on older motor vehicles, heavy-duty gasoline engines and vehicles, motorcycles, and nonroad products. Stakeholders have further suggested that, if a unique misfueling Web site is created, then EPA should require the Web site address to be displayed on the E15, E85, and midlevel ethanol blend pump labels. EPA seeks comment on the appropriateness of a unique misfueling Web site and of including such a Web site address on these labels. Many of these efforts have already been taken by industry stakeholders. EPA seeks comment on how current industry efforts can be adapted to further the agency's goal of reducing misfueling.

Finally, EPA requests comment on whether to mandate the continued availability of fuels containing 10 percent or less ethanol. We also seek comment on whether to require fuel retailers to maintain a dedicated fuel pump to dispense E10 or E0 gasoline.

We also seek comment on any other measures not proposed in the rule that the regulated industries and other interested parties feel may be necessary to mitigate misfueling. We seek comment on any other cost-effective mitigation measures that may be appropriate. If EPA considers requiring any other mitigation measures that are suggested by commenters in the final rule, EPA will conduct appropriate analyses of such measures, including the impacts on small businesses, before deciding whether to include such mitigation measures in the final rule.

Conclusion

OPEI and NMMA appreciate the opportunity to provide the foregoing comments and background information to inform EPA's proposal to allow E15 to be sold year-round. Attached to these comments is additional background information regarding the effects of E15 on outdoor power equipment and marine engines. Please contact Dan Mustico at

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dmustico@opei.org or 703- 678-2990 or Nicole Vasilaros at nvasilaros@nmma.org or 202-737-9763 with any questions.

Sincerely,

Handwritten signature of Daniel J. Mustico in black ink.

Dan Mustico

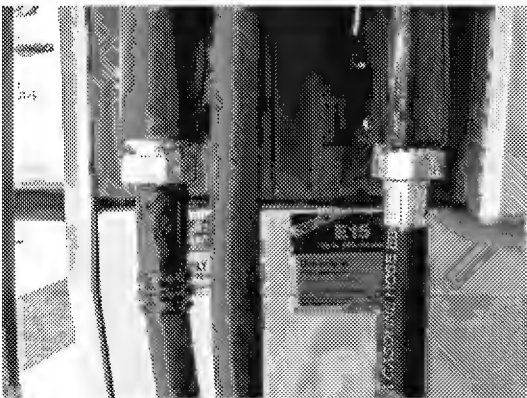
Vice President, Government and Market Affairs
Outdoor Power Equipment Institute

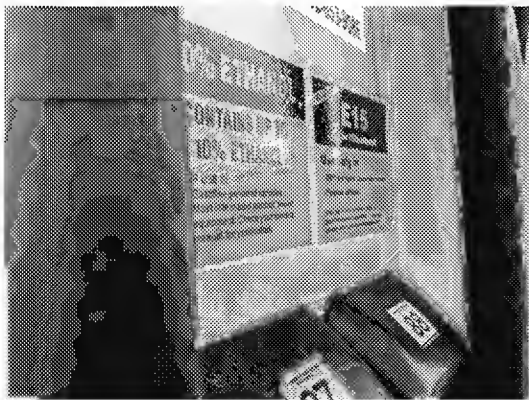
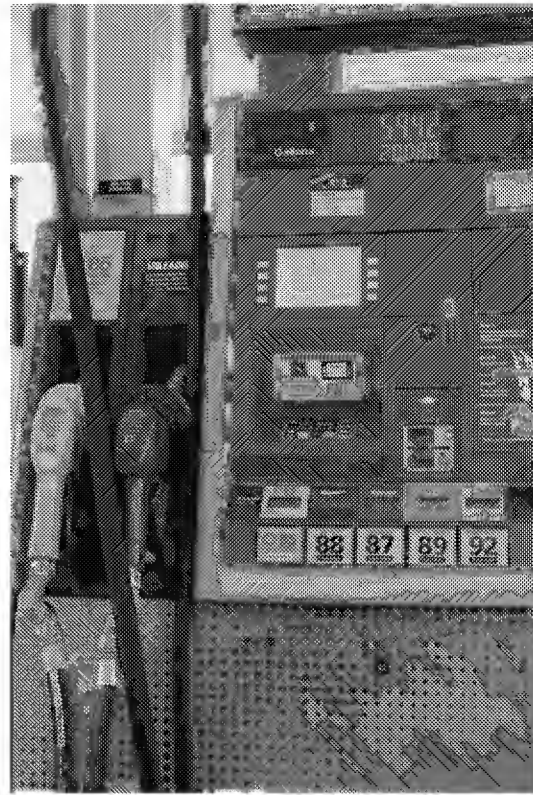
Nicole Vasilaros

SVP, Government and Legal Affairs
National Marine Manufacturers Association

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ATTACHMENT 1



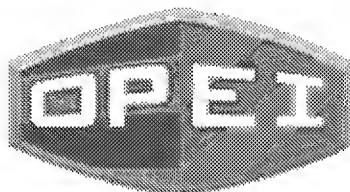


ATTACHMENT 2

Look Before You Pump Survey Results

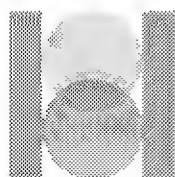
March 2, 2018

Prepared For:



OUTDOOR POWER EQUIPMENT
INSTITUTE

Prepared By:



Harris On Demand
The Harris Poll

Research Method and Note about the Report

Research Method

The surveys were conducted online within the United States by Harris Poll on behalf of Outdoor Power Equipment Institute among US adults ages 18+. The 2018 survey was conducted between February 20-22, 2018 among 2,027 adults. The 2017 survey was conducted between February 27 and March 1, 2017 among 2,186 adults. The 2016 survey was conducted between March 11-15, 2016 among 2,023 adults. The 2015 survey was conducted between April 23-27, 2015 among 2,015 adults.

Results were weighted for age within gender, region, race/ethnicity, income, and education where necessary to align them with their actual proportions in the population. Propensity score weighting was also used to adjust for respondents' propensity to be online.

All sample surveys and polls, whether or not they use probability sampling, are subject to multiple sources of error which are most often not possible to quantify or estimate, including sampling error, coverage error, error associated with nonresponse, error associated with question wording and response options, and post-survey weighting and adjustments. Therefore, Harris Poll avoids the words "margin of error" as they are misleading. All that can be calculated are different possible sampling errors with different probabilities for pure, unweighted, random samples with 100% response rates. These are only theoretical because no published polls come close to this ideal.

Respondents for this survey were selected from among those who have agreed to participate in online surveys. The data have been weighted to reflect the composition of the adult population. Because the sample is based on those who agreed to participate in our panel, no estimates of theoretical sampling error can be calculated.

A Note about Reading the Report

The percentage of respondents has been included for each item.

- An asterisk (*) signifies a value of less than one-half percent.
- A dash represents a value of zero.
- Percentages may not always add up to 100% because of computer rounding or the acceptance of multiple responses.

How to Read Data Tables: Key Terms & Statistical Significance Testing

Tabs or Cross-tab(s): This is short for cross-tabulations, or data tables. Raw survey data are tabulated to depict the results based on aggregate groups of respondents, typically, the “Total” sample, as well as subgroups that can be compared against one another to see if there are statistically significant differences among them (e.g., men vs. women).

Banner: A banner is essentially a set of cross-tabs.

Banner point: A banner point is a column in the data tables – a single banner, or page of cross-tabs, can typically include about 20 columns, or banner points (depends partly on the banner point titles/labels). Banner points enable us to compare two or more groups to one another to see if there are statistically significant differences among them (e.g., the data for “men” would be contained in one banner point and “women” in another, with the two columns stat-tested against one another to determine if the differences are statistically significant).

Statistical significance testing: Two or more banner points can be tested for significant differences based on a statistical formula called a t-test – whether or not a difference between 2 or more groups is significant depends not only on the magnitude of the difference, but also on the sizes of the samples being compared (i.e., the smaller the samples, the larger a difference would have to be in order to be considered statistically significant).

Significance testing is done at the 95% confidence level, and the test is performed on percentages as well as means. Each subgroup is contained in a banner point and assigned a letter. When the percentage of one subgroup is significantly different from the percentage of another subgroup, the letter representing one of the two samples appears next to the percentage (or mean) of the other sample.

For example, the proportion of males answering “yes” to a particular question may be compared to the percentage of females answering “yes” to the same question, as follows:

- In the table below, the male sample is assigned the letter B and the female sample is assigned the letter C.
- 67% of women said “yes” – a proportion that is significantly greater than the 57% of males who said “yes.”
- To indicate that women are significantly more likely to say “yes” than are men, the letter B (i.e., the letter assigned to the male subgroup) appears next to the “67%” in the female column.
- Similarly, the 37% of men who said “no” is significantly greater than the 29% of women who said “no,” so the letter C (i.e., the letter assigned to the female subgroup) appears next to the “37%” in the male column.
- It is these letters that indicate statistically significant differences among two or more subgroups – if there are no letters next to a percentage, then the differences are not statistically significant and may not be described as true differences in attitude or behavior among subgroups.

	Gender		
	Total	Male	Female
	(A)	(B)	(C)
Unweighted Total	977	488	489
Weighted Total	967	464	503
Yes	611 63%	274 57%	337 67%B
No	319 33%	171 37%C	148 29%
Don't Know	37 4%	18 4%	19 4%

Key Findings

Ethanol Awareness

Most Americans are aware that there is ethanol in gasoline, however, many do not seem to know that gasoline with a high ethanol content (higher than 10 percent) is currently available at gas stations. While more than 4 in 5 Americans (84%) know that gasoline contains ethanol, more than 2 in 5 (41%) admit they are not aware that higher ethanol blends of gasoline are currently available at gas stations. Perhaps this can be attributed to lack of media attention on the subject, or at least memorable attention - nearly two thirds of Americans (64%) did not see, hear or read anything in the news regarding levels of ethanol at fuel pumps at gas stations in the past 12 months (up from 58% in 2015) and about 1 in 5 (18%) are not sure if they did.

Ethanol Misconceptions

Many Americans do not realize that higher blends of ethanol gasoline are not safe and illegal to use in some engines. Only a third of Americans (33%) think higher ethanol blends of gasoline are harmful to engines such as those in boats, mowers, chain saws, snow mobiles, generators, and other engine products. On the flip side, nearly 2 in 5 Americans (38%) believe this type of gasoline is safe to use for any gasoline engine – this number jumps to 42% among men. This misconception is at its highest since 2015 - Americans are more likely in 2018 than in the past 3 years to believe higher ethanol blends of gasoline are safe to use for any gasoline engine (38% vs. 31% in 2017, 31% in 2016, and 30% in 2015). Perhaps this lack of knowledge is due to many blindly trusting that gas stations wouldn't sell fuel that isn't safe. Nearly two thirds of Americans (65%) assume that any gas sold at the gas station is safe for all cars, as well as boats, mowers, chain saws, snow mobiles, generators and other engine products.

Shockingly, one in five Americans (20%) think it is legal to put gasoline with an ethanol content higher than 10 percent into engines such as those in boats, mowers, chain saws, snow mobiles, generators and other engine products – this jumps to 30% among men – and the majority of Americans (68%) are not at all sure if it is legal. This ignorance may not be at the fault of the consumer, however, as the EPA has put out a non-mandatory label, 2.5 x 2.5 inch, for gas stations to post if they sell fuel greater than E10. When asked about the current voluntary warning label to inform consumers about E15 fuel being illegal to use in outdoor power equipment, more than 3 in 5 Americans (63%) feel it is inadequate – with women being more likely than men to feel this way (67% vs. 59%).

Bad Behavior at the Pump

While many Americans notice items specific to payment at a gas pump, like price (85%) and if a pump accepts credit cards (57%), far fewer notice the ethanol content. Only 1 in 5 Americans (20%, down from 25% in 2017) say they notice the ethanol content when at a gas pump, with more saying they notice advertisements for specials available inside (24%). Which begs the question, are less people paying attention to ethanol content because they just don't see it, or because they are not aware how it could impact their fueling?

It appears it could be a little bit of both, based on current misconceptions and Americans' habits at the fuel pump. Just over 2 in 5 Americans (41%) admit they do not check the fuel pump for any warning labels when they fuel up their car, and more than one third (36%) do not always read the labels on the fuel pumps. Furthermore, about 3 in 5 Americans (59%) say they typically only pay attention to labels on fuel pumps that read "Warning" or "Do Not Use In..." – this number jumps to 67% among adults ages 18-34.

With all of that in mind, it's no surprise that many Americans are likely fueling incorrectly. Roughly two thirds (66%) admit they will use the least expensive grade of gasoline whenever possible and more than half (51%) fill up their portable gas tank with the same fuel used to fill their vehicle.

Mis-Fueling Outdoor Power Equipment

While attention to fuel types has gone up since 2015 (43% in 2018 vs. 35% in 2015), outdoor power equipment owners are still making mistakes when it comes to their equipment. Among the 63% of Americans who own outdoor power equipment, less than half (43%) say they pay attention to the type of fuel they put into their equipment and just over one third (35%) don't know what type of fuel they are using. Additionally, about 1 in 10 Americans who own outdoor power equipment are mis-fueling – 11% of Americans say they have used E15, E30, E50, or E85 to fuel their equipment, up from 7% in 2015. Perhaps this misuse of higher ethanol blends of gasoline could be attributed to the fact that while it is more widely available, there is inadequate information at fuel pumps on when it is not safe to use them. While there is a clear need for more adequate labeling, there is also a need for more availability of safe fuel to use in engines other than cars - roughly two thirds of Americans (66%) feel ethanol-free gas should be more widely available at gas stations.

Caring For Outdoor Power Equipment

Most Americans who own outdoor power equipment appear to be confident in their gasoline storage habits – more than 4 in 5 (84%) say they always use a safe container when they store gasoline for their outdoor power equipment. However, the proper safety methods seem to end there. More than one third of Americans who own outdoor power equipment (35%) may be using stale fuel in their equipment as they admit to not running the tank dry/draining the fuel out of their equipment before storing it. Additionally, less than one third of Americans who own outdoor power equipment (29%) label the gasoline storage container they use for their outdoor power equipment with the date they purchased the fuel. This lack of labeling suggests that most don't understand the impacts of using old fuel. To further support that, over half of Americans who own outdoor power equipment (53%) would put fuel that is more than 30 days old in their equipment.

'Look Before You Pump' May Make an Impact at the Pump

Based on survey results, the 'Look Before You Pump' campaign's strong potential to impact Americans' actions at the pump remains strong. If they saw the 'Look Before You Pump' image nearly 9 in 10 Americans (89% in 2018 and 87% in 2017) claim they would be likely to make sure they are fueling correctly, while about 4 in 5 (81% in 2018 and 80% in 2017) would be likely to pay more attention to fuel types when putting gas in a jerry can/gasoline can. The impact on outdoor power equipment owners has increased this year – 86% say if they saw that image, they would be likely to pay more attention to fuel types when they put gas in their outdoor power equipment, compared to 82% last year. Additionally, the image has the potential to create other positive behaviors. Roughly two thirds of Americans would be likely to research different types of fuels (64%) or change the type of fuel they use (64%) if they saw the "Look Before You Pump" image

Key Findings

Notable Differences in Data Year Over Year

- Americans are more likely in 2018 than in 2016 and 2015 to say that they assume that any gas sold at the gas station is safe for all of their cars as well as boats, mowers, chain saws, snow mobiles, generators and other engine products. (65% vs. 60% and 57%, respectively).
- When arriving at the fuel pump at a gas station, there are some differences in what Americans notice on the pump year over year:
 - Less likely in 2018 than in 2017 to notice the ethanol content (20% vs. 25%)
- Americans are more likely in 2018 than in 2016 and 2015 to always read the labels on fuel pumps (58% vs. 53% and 50%, respectively).
- Americans are more likely in 2018 than in 2015 to say when they fuel up their car at the gas station, they check the fuel pump for any warning labels (53% vs. 47%, respectively).
- Americans are more likely in 2018 than in the past 3 years to believe higher ethanol blends of gasoline are safe to use for any gasoline engine (38% vs. 31% in 2017 and 2016, and 30% in 2015).
- Americans are more likely in 2018 than in 2016 and 2015 to think it is legal to put high level ethanol gas into engines such as those in boats, mowers, chain saws, snow mobiles, generators and other engine products (20% vs. 15% and 16%, respectively).
- In terms of equipment maintenance, there are also some differences year to year in how Americans who own outdoor power equipment take care of their engines:
 - More likely in 2018 to pay attention to the type of fuel they use in outdoor power equipment than in 2016 and 2015 (43% vs. 36% and 35%, respectively)
 - More likely in 2018 than in 2015 to say they use E15/E30/E50/E85 in their outdoor power equipment (11% vs. 7%)
 - Less likely in 2018 than 2016 and 2015 to be unsure of what fuel they use in their outdoor equipment (35% vs. 42% and 45%, respectively)
 - More likely in 2018 than in 2016 to place equipment into long-term storage without draining the fuel tank (35% vs. 28%)
 - More likely to use diesel fuel in a non-diesel engine in 2018 than in 2016 (5% vs. 3%)
 - More likely in 2018 than in 2017 to not label gasoline storage containers used for their outdoor power equipment with the date they purchased fuel (57% vs. 49%)
 - More likely in 2018 than in 2017 to say if they saw the “Look Before You Pump” image, they would be likely to pay more attention to fuel types when they put gas in their outdoor power equipment (86% vs. 82%)

**significant at 95% confidence level*

Topline Data**BASE: U.S. RESPONDENTS**

Q5 When you arrive at the fuel pump in a gas station, which of the following things do you notice on the pump? Please select all that apply.

BASE: All Respondents	2018 (A)	2017 (B)	2016 (C)	2015 (D)
<i>n=</i>	2,027	2,186	2,023	2,015
EVER DRIVE/USE A FUEL PUMP (NET)	96%BD	92%	94%	93%
Price	85%	83%	86%B	86%B
If the pump accepts credit card payment	57%C	53%	52%	55%
Octane rating (e.g., 87 regular, 91 premium)	54%D	53%D	53%D	48%
Advertised specials available inside (e.g., beverages, food)	24%C	21%	19%	23%C
Ethanol content	20%	25%A	23%	23%
Other	2%	4%A	3%	3%
N/A – I don't ever drive/use a fuel pump.	4%	8%A	6%	7%A

BASE: Ever Drive/Use A Fuel Pump	2018 (A)	2017 (B)	2016 (C)	2015 (D)
<i>n=</i>	1,928	2,034	1,893	1,852
Price	89%	89%	92%A	93%AB
If the pump accepts credit card payment	60%C	57%	55%	59%
Octane rating (e.g., 87 regular, 91 premium)	57%D	58%D	56%	52%
Advertised specials available inside (e.g., beverages, food)	25%C	23%	20%	25%C
Ethanol content	21%	27%A	24%	25%
Other	2%	5%A	4%A	4%A

BASE: U.S. RESPONDENTS

Q10 Do you know that there is ethanol in gasoline?

	2018 (A)	2017 (B)	2016 (C)	2015 (D)
<i>n=</i>	2,027	2,186	2,023	2,015
Yes	84%	84%	85%	84%
No	16%	16%	15%	16%

BASE: U.S. RESPONDENTS

Q15 Do you recall seeing, hearing or reading anything in the news regarding levels of ethanol at fuel pumps at gas stations in the past 12 months?

	2018 (A)	2017 (B)	2016 (C)	2015 (D)
<i>n=</i>	2,027	2,186	2,023	2,015
Yes	19%	18%	19%	22%BC
No	64%D	64%D	63%D	58%
Not sure	18%	18%	18%	20%

BASE: U.S. RESPONDENTS

Q20 How strongly do you agree or disagree with the following statement? "I have become aware within the last 2 years that higher ethanol blends of gasoline are available at fuel pumps at gas stations"

	2018 (A)	2017 (B)	2016 (C)	2015 (D)
<i>n=</i>	2,027	2,186	2,023	2,015
ALREADY AWARE/HAVE BECOME AWARE WITHIN LAST 2 Years (NET)	59%	59%	59%	61%
I was already aware that higher ethanol blends of gasoline are available at fuel pumps at gas stations.	19%	24%A	26%A	26%A
STRONGLY/SOMEWHAT AGREE (SUBNET)	39%BCD	35%	33%	35%
Strongly agree	8%C	8%C	5%	7%C
Somewhat agree	31%B	27%	28%	29%
STRONGLY/SOMEWHAT DISAGREE (SUBNET)	41%	41%	41%	39%
Somewhat disagree	20%	21%	23%	22%
Strongly disagree	21%D	19%	18%	17%

BASE: U.S. RESPONDENTS

Q25 How strongly do you agree or disagree with each of the following statements?

Summary of Strongly/Somewhat Agree

	2018 (A)	2017 (B)	2016 (C)	2015 (D)
<i>n=</i>	2,027	2,186	2,023	2,015
I will use the least expensive grade of gasoline whenever possible.	66%	69%D	66%	63%
I assume that any gas sold at the gas station is safe for all of my cars, as well as boats, mowers, chain saws, snow mobiles, generators and other engine products.	65%CD	63%D	60%	57%
I typically only pay attention to labels on fuel pumps that read "Warning" or "Do Not Use In..."	59%D	55%	57%D	51%
I always read the labels on fuel pumps.	58%CD	55%D	53%	50%
When I fuel up my car at the gas station, I check the fuel pump for any warning labels.	53%D	53%D	50%	47%
I fill up my portable gas tank (i.e., jerry can) with the same fuel used to fill my vehicle.	51%	51%	51%	48%

Summary of Strongly/Somewhat Disagree

	2018 (A)	2017 (B)	2016 (C)	2015 (D)
<i>n=</i>	2,027	2,186	2,023	2,015
When I fuel up my car at the gas station, I check the fuel pump for any warning labels.	41%	38%	41%	45% B
I always read the labels on fuel pumps.	36%	37%	39%	42% AB
I typically only pay attention to labels on fuel pumps that read "Warning" or "Do Not Use In..."	34%	34%	34%	39% ABC
I will use the least expensive grade of gasoline whenever possible.	29% B	23%	26%	28% B
I assume that any gas sold at the gas station is safe for all of my cars, as well as boats, mowers, chain saws, snow mobiles, generators and other engine products.	28%	27%	31% B	33% AB
I fill up my portable gas tank (i.e., jerry can) with the same fuel used to fill my vehicle.	15%	16%	16%	19% A

BASE: U.S. RESPONDENTS**Q30** Which of the following statements do you believe to be true of higher ethanol blends of gasoline?

	2018 (A)	2017 (B)	2016 (C)	2015 (D)
<i>n=</i>	2,027	2,186	2,023	2,015
They are safe to use for any gasoline (i.e., non-diesel) engine.	38% BCD	31%	31%	30%
HARMFUL/ILLEGAL (NET)	36%	38%D	36%	33%
They are harmful to engines such as those in boats, mowers, chain saws, snow mobiles, generators and other engine products.	33%	33%	31%	30%
They are illegal to use in engines such as those in boats, mowers, chain saws, snow mobiles, generators and other engine products.	6% D	7% D	5% D	3%
None of these	28%	36% A	38% A	37% A

BASE: U.S. RESPONDENTS**Q35** Which of the following statements do you believe is true?

	2018 (A)	2017 (B)	2016 (C)	2015 (D)
<i>n=</i>	2,027	2,186	2,023	2,015
It is legal to put high level ethanol gas (i.e., anything higher than 10 percent ethanol) into engines such as those in boats, mowers, chain saws, snow mobiles, generators and other engine products.	20% CD	18%	15%	16%
It is illegal to put high level ethanol gas (i.e., anything higher than 10 percent ethanol) into engines such as those in boats, mowers, chain saws, snow mobiles, generators and other engine products.	12%	10%	10%	10%
I am not at all sure.	68%	73% A	75% A	74% A

BASE: U.S. RESPONDENTS

Q40 What kind of fuel do you use for your outdoor power equipment (e.g., lawn mower, garden tractor, chain saw, snow blower, string or line trimmer)?

BASE: All Respondents	2018 (A)	2017 (B)	2016 (C)	2015 (D)
<i>n=</i>	2,027	2,186	2,023	2,015
OWN ANY OUTDOOR POWER EQUIPMENT (NET)	63%D	59%	60%	58%
EVER PAY ATTENTION TO FUEL TYPE (SUBNET)	27%CD	26%CD	22%	20%
0 ethanol	6%	7%	5%	5%
E10	11% CD	9%	9%	9%
E15/E30/E50/E85 (SUBNET)	7%CD	7%CD	5%	4%
E15	3% BCD	1%	1%	1%
E30	2%	2% D	1%	1%
E50	1%	1% C	*	1%
E85	2%	2%	2%	2%
Other	2%	3%	3%	2%
I do not pay any attention to the type of fuel I use in my outdoor power equipment.	14%	12%	13%	12%
Not sure	22%	22%	25%	26% AB
N/A - I do not own any outdoor power equipment.	37%	41%	40%	42% A

BASE: Own Any Outdoor Power Equipment	2018 (A)	2017 (B)	2016 (C)	2015 (D)
<i>n=</i>	1,254	1,243	1,209	1,142
EVER PAY ATTENTION TO FUEL TYPE (NET)	43%CD	44%CD	36%	35%
0 ethanol	9%	11%	8%	9%
E10	18%	16%	15%	15%
E15/E30/E50/E85 (SUBNET)	11% D	12% CD	8%	7%
E15	4% BCD	2%	2%	1%
E30	2%	4% D	2%	1%
E50	1%	2% C	*	1%
E85	4%	4%	4%	3%
Other	4%	5%	4%	4%
I do not pay any attention to the type of fuel I use in my outdoor power equipment.	22%	20%	22%	20%
Not sure	35%	37%	42% AB	45% AB

BASE: OWN ANY OUTDOOR POWER EQUIPMENT

Q45 Which of the following, if any, have you ever done/experienced regarding your outdoor power equipment? Please select all that apply.

	2018 (A)	2017 (B)	2016 (C)	2015
<i>n=</i>	1,254	1,243	1,209	1,142
Mixed fuel stabilizer in with the fuel	35%	33%	32%	n/a
Placed equipment into long-term storage without draining the fuel tank	35% C	31%	28%	33%
Used an E15 or higher fuel in an engine not designed for it	5%	5%	4%	3%
Used diesel fuel in a non-diesel engine	5% C	5% C	3%	3%
Other	1%	2%	2%	3%
None	37%	41%	48% AB	61%

BASE: OWN ANY OUTDOOR POWER EQUIPMENT**Q50** How strongly do you agree or disagree with each of the following statements?**Summary of Strongly/Somewhat Agree**

	2018 (A)	2017 (B)	2016 (C)
<i>n=</i>	1,254	1,243	1,209
When I store gasoline for my outdoor power equipment, I always use a safe container (e.g., a jerry can designed to hold fuel).	84%	80%	83%
I run the tank dry or drain the fuel out of my outdoor power equipment before storing it.	54%	57%	54%
When it comes to fueling my outdoor power equipment, I only use E10 or less gasoline.	53%	50%	49%
I would never put fuel that is more than 30 days old in my outdoor power equipment.	35%	37%	37%
I label the gasoline storage container I use for my outdoor power equipment with the date I purchased the fuel.	29%	35% AC	29%

Summary of Strongly/Somewhat Disagree

	2018 (A)	2017 (B)	2016 (C)
<i>n=</i>	1,254	1,243	1,209
I label the gasoline storage container I use for my outdoor power equipment with the date I purchased the fuel.	57% B	49%	59% B
I would never put fuel that is more than 30 days old in my outdoor power equipment.	53%	48%	51%
I run the tank dry or drain the fuel out of my outdoor power equipment before storing it.	35%	30%	35% B
When it comes to fueling my outdoor power equipment, I only use E10 or less gasoline.	24%	25%	27%
When I store gasoline for my outdoor power equipment, I always use a safe container (e.g., a jerry can designed to hold fuel).	6%	6%	5%

BASE: U.S. RESPONDENTS**Q55** How likely would you be to do each of the following if you saw the following image?**Summary of Very/Somewhat Likely**

	2018 (A)	2017 (B)
<i>n=</i>	Variable bases	Variable bases
Make sure I am fueling correctly (i.e., using the correct fuel for the type of engine I am fueling)	89%	87%
Pay more attention to fuel types when I put gas in my outdoor power equipment	86% B	82%
Pay more attention to fuel types when I put gas in a jerry can/gasoline can	81%	80%
Research different types of fuel	64%	67%
Change the type of fuel I use	64%	63%

Summary of Not At All/Not Very Likely

	2018 (A)	2017 (B)
<i>n=</i>	Variable bases	Variable bases
Change the type of fuel I use	36%	37%
Research different types of fuel	36%	33%
Pay more attention to fuel types when I put gas in a jerry can/gasoline can	19%	20%
Pay more attention to fuel types when I put gas in my outdoor power equipment	14%	18% A
Make sure I am fueling correctly (i.e., using the correct fuel for the type of engine I am fueling)	11%	13%

BASE: U.S. RESPONDENTS

Q60 As you may already know, E15 fuel is more widely available than it was 2 years ago, yet it is illegal to use in outdoor power equipment as the Environmental Protection Agency (EPA) has deemed it unsafe for use in most outdoor power equipment. There is a small (2.5 x 2.5 inch) warning label that the EPA put out, which is voluntary for gas stations to post on pumps that sell fuel greater than E10.

Do you think the current voluntary warning label is adequate (i.e., fine as is) or inadequate (i.e., the label should be larger, more clear, mandatory) to inform consumers about E15 fuel being illegal to use in outdoor power equipment?

	2018 (A)
<i>n=</i>	2,027
Inadequate	63%
Adequate	37%

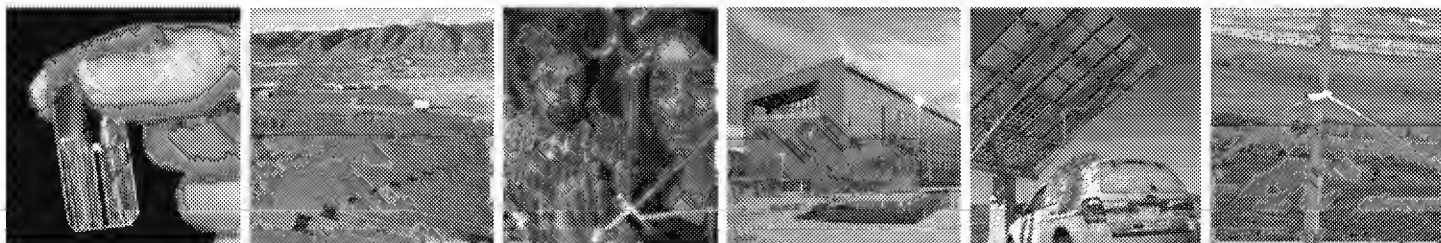
BASE: U.S. RESPONDENTS

Q65 How much do you agree or disagree with the following statement?

Ethanol-free gas should be more widely available at gas pumps.

	2018 (A)
<i>n=</i>	2,027
STRONGLY/SOMEWHAT AGREE (NET)	66%
Strongly agree	34%
Somewhat agree	33%
STRONGLY/SOMEWHAT DISAGREE (NET)	10%
Somewhat disagree	6%
Strongly disagree	4%
Not sure	24%

ATTACHMENT 3



Blender Pump Fuel Survey: CRC Project E-95-2

A. Williams and T.L. Alleman

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October 2013

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Prepared under Task No. VTP2.0072

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List of Acronyms

ASTM	ASTM International
CRC	Coordinating Research Council
EPA	U.S. Environmental Protection Agency
Exx	xx vol% ethanol blended with pure gasoline
MLEB	mid-level ethanol blend
NREL	National Renewable Energy Laboratory
vol%	volume percent

Executive Summary

In 2012, the U.S. gasoline market was about 134 billion gallons [1], and the fuel ethanol market was 13.3 billion gallons [2]. Almost all fuel ethanol is used in gasoline as a 10 volume percent (vol%) blend. A far less significant amount is used as “E85” Flex Fuel (a fuel compliant with ASTM International Specification D5798 and formerly called E85). Mid-level ethanol blends (MLEBs) are an emerging ethanol option that contain more than 10 vol% ethanol but less than 50 vol% ethanol. MLEBs are typically sold as discrete blends, such as 20 vol% (E20), and 30 vol% (E30). The argument for offering MLEBs is to give consumers with Flex Fuel vehicles additional fuel choices at the pump.

The Coordinating Research Council and the U.S. Department of Energy’s National Renewable Energy Laboratory conducted a survey of MLEBs in the market, in order to provide a snapshot of selected characteristics of the increasingly diverse array of fuels available to U.S. motorists. A total of 73 fuel samples were collected in February of 2013 from 20 retail stations located in the midwestern United States. Samples included gasoline (E0 or E10), “E85” Flex Fuel, and every MLEB that was offered from each of the 20 stations.

All samples were analyzed by Southwest Research Institute for vapor pressure and ethanol content. For E10 samples there was very little variation in ethanol content. For the MLEB samples variability was higher, typically failing to meet the advertised ethanol level by 3 to 4 vol%, and in one case was off by 10 vol%. One of the 20 “E85” Flex Fuel samples was above the allowable limits for ethanol content. Four of the 20 “E85” Flex Fuel samples had vapor pressures below the minimum requirement.

In addition photographs of each station were taken at the time of sample collection, detailing the dispenser labeling and configuration. The style and labeling of the dispenser, hose and nozzle are all important features to prevent misfueling events. Furthermore, the physical location of the MLEB product relative to the gasoline product can also be important to prevent misfueling. In general there were many differences in the style and labeling of the dispensers surveyed in this study.

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Introduction

In 2012, the U.S. gasoline market was about 134 billion gallons [1], and the fuel ethanol market was 13.3 billion gallons [2]. Almost all fuel ethanol is used in gasoline as a 10 volume percent (vol%) blend. A far smaller amount is used in “E85” Flex Fuel (a fuel compliant with ASTM International [ASTM] Specification D5798 and formerly called E85). Mid-level ethanol blends (MLEBs) are an emerging blend of “E85” Flex Fuel and gasoline. MLEBs contain more than 10 vol% ethanol and less than 50 vol% ethanol and are typically sold as discrete blends, such as 20 vol% (E20), and 30 vol% (E30). The argument for offering MLEBs is to offer consumers with Flex Fuel vehicles additional fuel choices at the pump. The recent U.S. Environmental Protection Agency (EPA) waiver allowing up to E15 in 2001 and newer cars, trucks, and sport utility vehicles should increase the volume of MLEBs in the marketplace.

MLEBs are typically offered at stations with blender pumps. A blender pump draws fuel from two separate storage tanks and mixes the fuels to produce the desired ethanol blend ratio. In traditional gas stations, a blender pump is often used to get midgrade gasoline by mixing the regular and premium grade fuels. In a station that offers MLEBs, the blends are generally made by mixing “E85” Flex Fuel with regular gasoline [3].

With the increasing fuel diversity in the marketplace, the Coordinating Research Council (CRC) and the U.S. Department of Energy’s National Renewable Energy Laboratory (NREL) conducted a survey of MLEBs in the market. The project assumed that the MLEBs were blended at the dispenser, by a so-called blender pump, from parent gasoline and D5798-compliant “E85” Flex Fuel.

Methodology

Station Identification

The U.S. Department of Energy’s Alternative Fuels Data Center was used to identify 20 stations with blender pumps that offered MLEBs. Each station was contacted prior to sample collection to ensure that MLEBs were being sold. While efforts were made to identify stations over a wide geographical area, these stations were all located in the midwestern United States. The relative locations of the stations are illustrated in Figure 1.

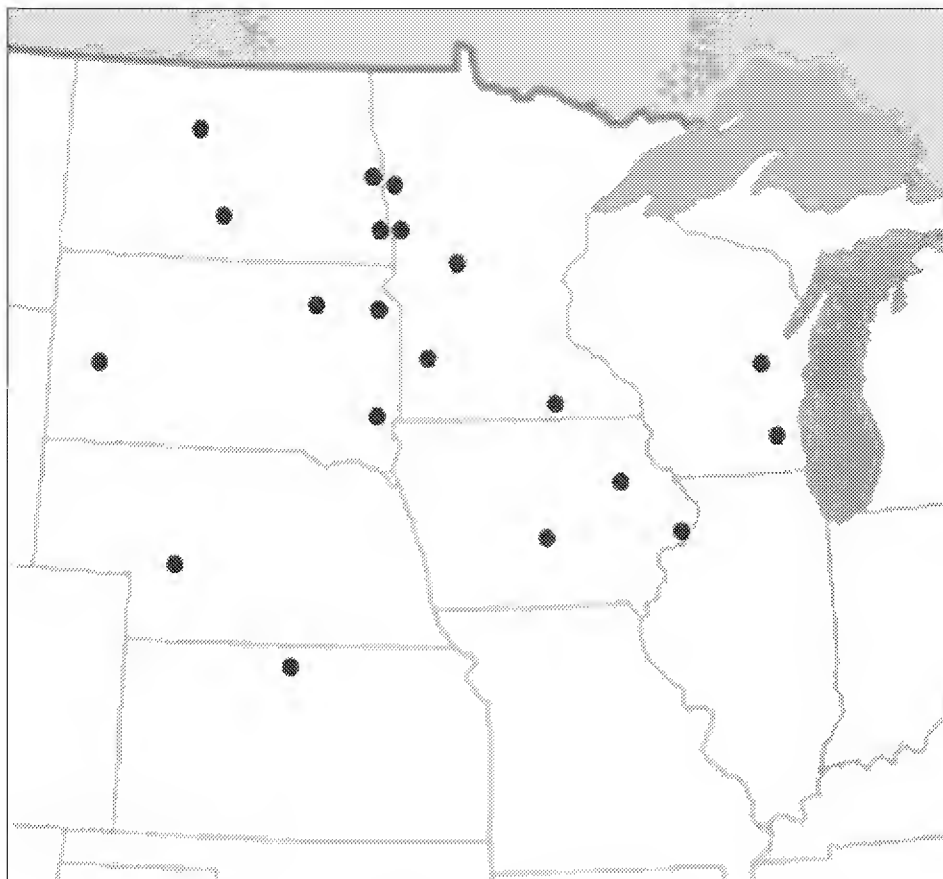


Figure 1. Relative station locations

Sample Collection and Photographs

A contractor was sent to each station to collect the fuel samples. At each station, a 1.5-liter sample was collected from each of the parent fuels (gasoline and “E85” Flex Fuel) along with every MLEB that was offered. In order to prevent sample carry-over, 3 liters of fuel were purged from the pump prior to collection of each individual fuel sample. A total of 73 fuel samples were collected from these 20 retail stations. All fuel samples were collected between February 9th and 26th of 2013, targeting the wintertime class (D5798 Class 4).

In the first E-95 study (2010), samples were collected in ASTM D5798 Class 1, which represents the lowest vapor pressure samples and the warmest months of the year (typically summertime fuels). Between the end of that study and the commencement of the current study, several things changed in the D5798 specification. First, D5798 was updated to reflect the necessity by blenders to adjust the hydrocarbon portion of the blend across a wider range than previously allowed. This change allowed for a consistent, and generally wider range, of allowable ethanol content in each class, with the goal of blenders being able to meet vapor pressure requirements more easily year-round. The second major change was the addition of a fourth class for the wintertime months. The new Class 4 was added in a further effort to help blends produce on-specification fuels in the winter months.

In this most recent study Class 4 fuels were targeted in order to draw the largest contrast to the Class 1 fuels sampled in a previous blender pump survey (CRC E-95) and to expand the limited information on commercially available “E85” Flex Fuel in this new class [4]. In the first E-95 study, multiple tests were run on the Flex Fuel only, such as pH, acidity, chloride, and sulfate. Results from that work, combined with results from CRC’s E-85 studies showed very few failures on these properties, even when the samples failed ethanol content and/or vapor pressure requirements. The decision to not test these properties on the Flex Fuel samples was twofold in this study: first, by reducing the number of tests, a larger number of samples could be collected, and second, with the focus of the study on blender pumps, only the critical properties of the parent fuels were collected (ethanol content and vapor pressure). By reducing the number of tests, the study was able to increase the number of stations from the previous project from 15 to 20, increasing the number of MLEB samples from 25 to 33.

Detailed photographs of the dispensers and stations were also taken at the time of sample collection. These included:

- Close-up photograph of dispenser, showing labeling specific to blends offered
- Photograph showing entire dispenser, including hoses
- Photograph of island including dispenser
- Photograph showing island configuration of MLEB dispenser, in relation to other islands at station
- Photograph of station sign, looking for any indication that MLEBs are being sold at station.

Property Analysis

All fuel samples were analyzed by Southwest Research Institute in San Antonio, Texas. The vapor pressure of the gasoline and the “E85” Flex Fuel was analyzed for comparison to their respective requirements in D4814 and D5798 using ASTM D5191. The vapor pressure of the MLEBs was also measured using the same method. The ethanol content of all fuel samples was analyzed and compared to the appropriate ASTM specification and dispenser labeling captured in the station photographs. Gasoline and E15 blends were analyzed using D5599; ethanol content in samples above E20 was measured by D5501. Samples were also analyzed for water content and specific gravity to allow for ethanol content to be reported in vol%.

Fuel Property Results

Gasoline Samples

To simplify sample collection, the contractor was instructed to sample regular unleaded gasoline, the “E85” Flex Fuel, and all MLEBs offered at each station visited. As discussed below, many of the stations offered E0 and E10. Because no additional direction was given to the contractor about what constituted “regular unleaded gasoline”, the samples collected varied and could be either E10 or E0 based on the contractor’s individual choice during sampling. In addition, it is unknown whether the MLEBs were blended from E0 or from E10.

Of the 20 stations that were sampled, every location offered Flex Fuel labeled as “E-85.” E30 was the most commonly available MLEB, offered at all but two stations. E20 was offered at half of the stations, while E15, E40, and E50 were less common. Thirteen of the 20 stations provided multiple options for MLEBs. One of the stations did not offer any MLEBs, although the station claimed to have the blends during the identification phase of the project. Table 1 shows the number of samples that were collected for each fuel type, along with statistics for the vapor pressure and ethanol content. As illustrated in this table, the ethanol content was generally lower than its indicated value.

Many of the stations offered both hydrocarbon gasoline (E0) as well as oxygenated gasoline (E10). The contractors tasked with collecting the fuel samples only collected one of the two gasoline options. Consequently, 11 samples of hydrocarbon gasoline and 9 samples of oxygenated gasoline were collected from the 20 stations. From the information collected, it was unclear which form of gasoline was used as the parent fuel to make the MLEBs in the blender pump.

Table 1. Summary of Results

Property	Fuel Type	# of Samples	Mean	Median	Standard Deviation
DVPE, psi	Gasoline (E0)	11	13.4	13.7	1.44
	Oxygenated Gasoline	9	14.4	14.6	0.70
	E15	3	14.2	14.0	0.41
	E20	10	13.9	13.9	0.69
	E30	18	13.5	13.6	0.92
	E40	1	14.2	14.2	NA
	E50	1	13.1	13.1	NA
	“E85” Flex Fuel	20	10.0	10.5	1.64
Ethanol Content, vol%	Gasoline (E0)	11	< 0.1	< 0.1	< 0.1
	Oxygenated Gasoline	9	10.4	10.3	0.10
	E15	3	16.8	17.3	0.92
	E20	10	18.0	17.3	3.35
	E30	18	26.7	26.9	2.59
	E40	1	29.7	29.7	NA
	E50	1	44.2	44.2	NA
	“E85” Flex Fuel	20	70.9	68.3	7.02

DVPE = dry vapor pressure equivalent

NA = not applicable

psi = pounds per square inch

For each of the fuel samples, the ethanol content was determined by the appropriate test method (D5599 or D5501) based on fuel dispenser labeling. Figure 2 shows the results for ethanol content of all samples. The data are organized by station, showing the ethanol content for each product offered at the 20 locations.

For the E10 samples there was very little variation in ethanol content. However, for the MLEB samples variability was higher, typically failing to meet the advertised ethanol level by 3 to 4 vol%. The fuels tended to be lower in ethanol content than their indicated amount. Those samples that were furthest from their indicated levels were: E40 from Station #13 (30 vol%), E30 from Station #8 (22 vol%), and both E20 and E30 from Station #7 (12 vol% and 22 vol%,

respectively). Also of note is that for stations that offered multiple MLEB products, those MLEBs generally trended either high or low in ethanol content together. The most notable exception was Station #3 where E20 was high at 22 vol% and E30 was low at 26 vol%. In this instance, these two fuels were supplied by separate blender pumps at the same fueling island.

Figure 2 also shows the lower and upper ethanol limit for “E85” Flex Fuel (51 vol% to 83 vol%), per ASTM Specification D5798-13a. As can be seen in the figure, all of the samples were within these limits with the exception of Station #6, which contained 94 vol% ethanol. In 2011, the D5798 specification was changed to reduce the minimum ethanol content from 68 vol% down to 51 vol% to allow for more high volatility hydrocarbon in the blends, which should result in an increase in vapor pressure. The E-85-1 and E-85-2 CRC reports both found that samples had difficulty meeting wintertime vapor pressure [5, 6]. The difficulty in meeting winter vapor pressure of “E85” Flex Fuel was one widely cited reason for a cessation of sales of “E85” Flex Fuel by Marathon Petroleum Company in 2009 [7]. In response to general industry difficulties, ASTM reduced the minimum ethanol content for all classes and added the fourth class to help ensure these fuels were fit for purpose.

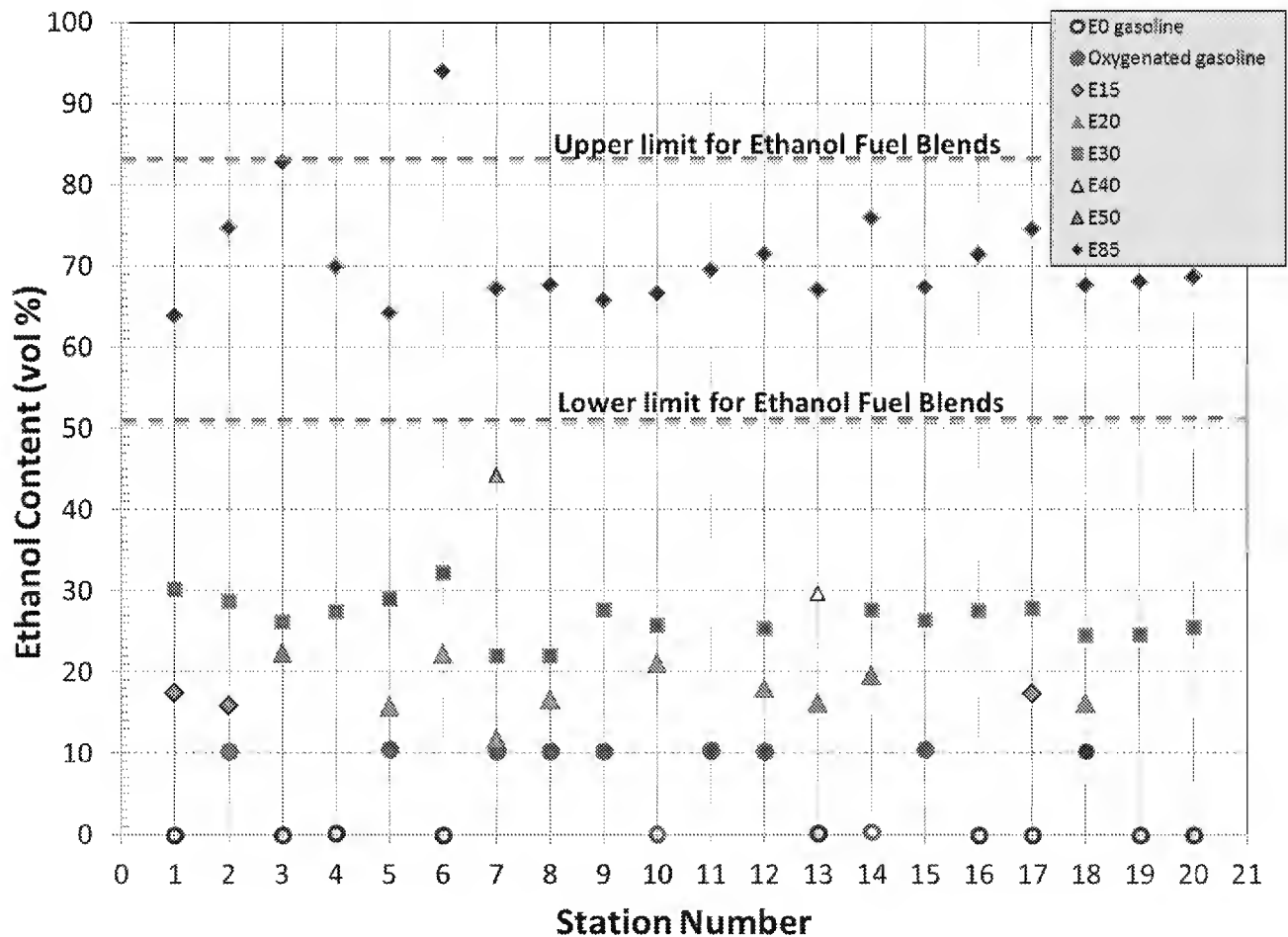


Figure 2. Ethanol content for all fuel samples

Gasoline and “E85” Flex Fuel are required to meet specifications for fuel vapor pressure that are dependent on location and time of year. All but one of the “E85” Flex Fuel samples in this survey would fall under D5798-11 Class 4, with a vapor pressure requirement of 9.5 to 15.0 psi. The one exception would be sample #14, collected in Kansas, which is listed as Class 3/4 for the month of February. The Class 3 vapor pressure requirement is 8.5 to 12.0 psi. Figure 3 shows the vapor pressure for all of these fuel samples along with the vapor pressure requirements for “E85” Flex Fuel. Four of the 20 “E85” Flex Fuel samples collected have vapor pressure below their minimum requirement, for a failure rate of 20%. For comparison, of the 37 Class 3 “E85” Flex Fuel samples collected in a previous fuel survey, the failure rate was 70% [6]. The extremely low vapor pressure of “E85” Flex Fuel collected at Station #6 is explained by the high level of ethanol (94 vol%).

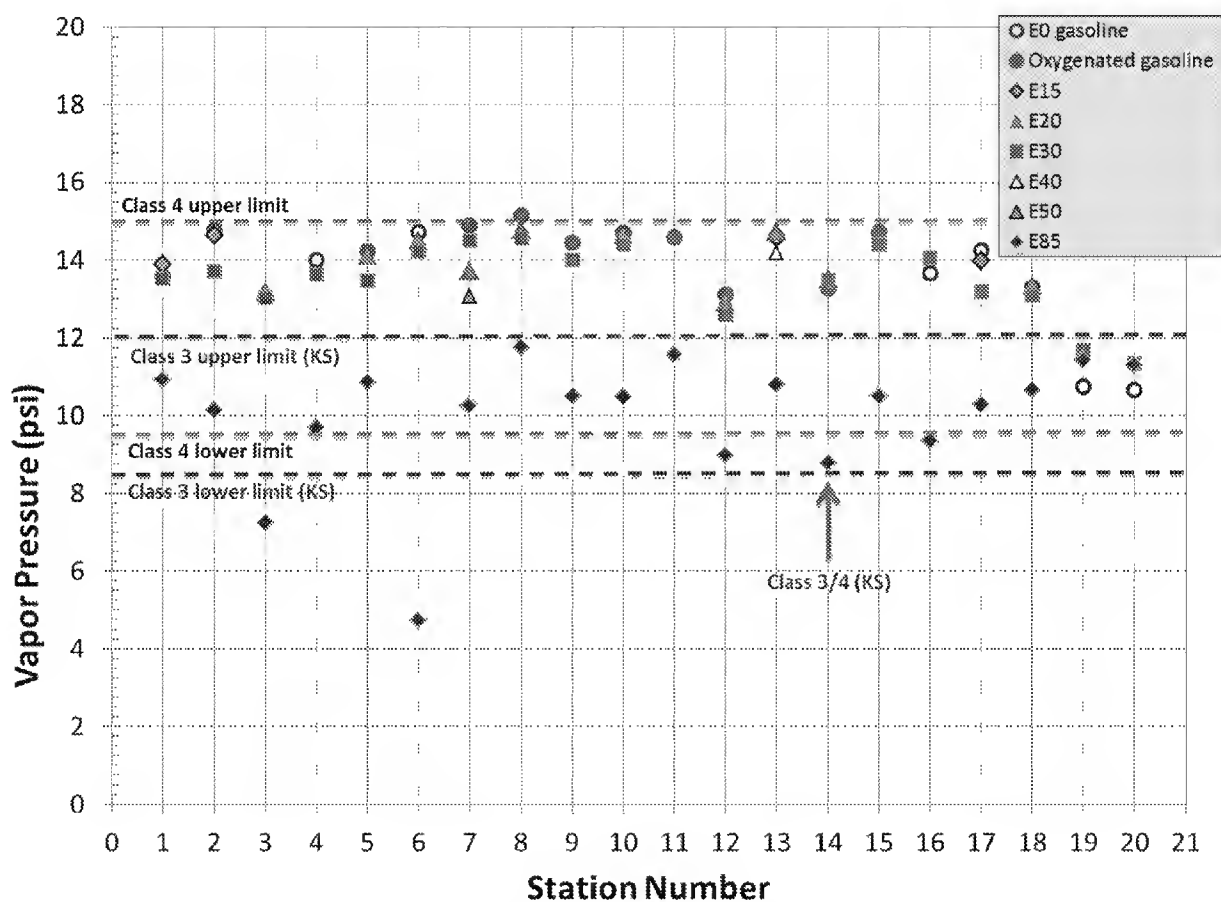


Figure 3. Vapor pressure for all fuel samples

Station Photos

An additional objective of this survey was to understand MLEB dispenser labeling. To make this assessment, detailed photographs of the stations and dispensers were taken at the time of sample collection. The style and labeling of the dispenser, hose, and nozzle are all important features to

minimize the probability of misfueling events. Furthermore, the physical location of the MLEB product relative to the gasoline product can also be important to prevent misfueling. As part of the E15 partial waiver, the EPA requires obligated parties to submit a Misfueling Mitigation Plan [8]. In March of 2012, the EPA concluded that a model plan developed by the Renewable Fuels Association was sufficient to satisfy this partial waiver requirement. As part of this model plan, the Renewable Fuels Association describes three configurations where blender pumps are used to produce E15. They are as follows:

1. A dedicated E15 dispenser or a dedicated E15 hose at a multiple fuel dispenser.
2. E15 from the same nozzle and hose as E10. This creates the potential for a vehicle not included under the E15 partial waiver to receive residual amounts of E15 when fueling with E10.
3. E15 from the same nozzle and hose as higher ethanol blends. This creates the potential for non-Flex Fuel vehicles to receive residual amounts of higher ethanol blends when being fueled with E15.

While the Renewable Fuels Association's Misfueling Mitigation Plan was written specifically for E15, we make an assessment here of how the stations in this survey offer MLEBs in comparison to the model plan guidelines. Three of the 20 stations in this survey offered E15 from the same nozzle and hose as higher ethanol blends (Configuration #3). Photos of this dispenser configuration as represented by these three stations are shown in Figures 4, 5, and 6. In addition, two of the 20 stations offered higher ethanol blends from the same hose as E10 (similar to Configuration #2). Photos of the dispensers in these two stations are shown in Figures 7 and 8. Each of the dispenser configurations in these five stations create the potential for introduction of residual amounts of higher ethanol fuel than is acceptable in non-Flex Fuel vehicles. Photographs of the other stations are included in the appendix.

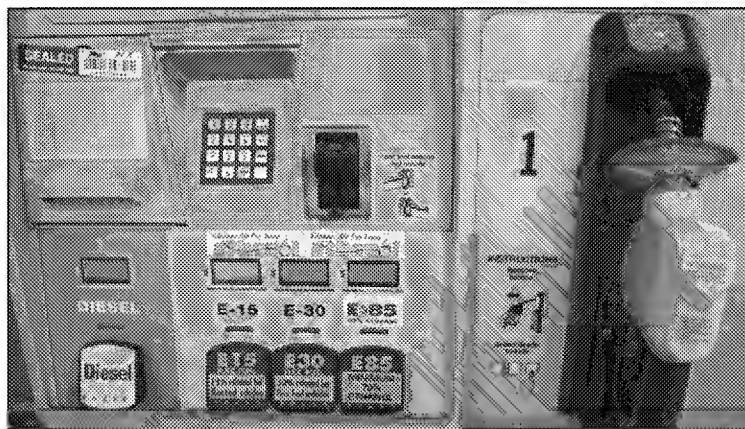


Figure 4. Station #1 offered E15 from same nozzle as higher ethanol blends

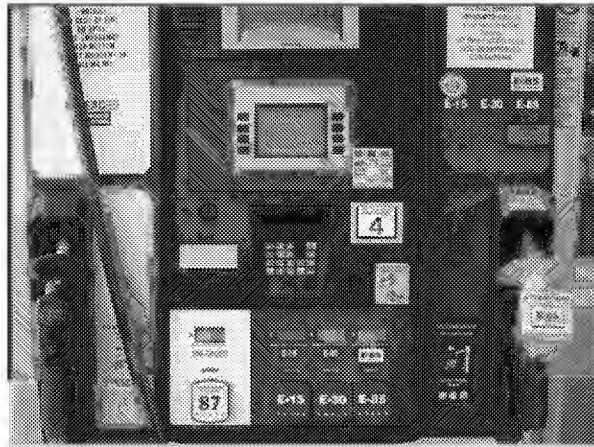


Figure 5. Station #2 offered E15 from same nozzle as higher ethanol blends



Figure 6. Station #17 offered E15 from same nozzle as higher ethanol blends



Figure 7. Station #3 offered higher ethanol blends from the same hose as E10



Figure 8. Station #14 offered higher ethanol blends from the same hose as E10

Photographs of each station can be found in the appendix. Other general observations that can be noted from these photographs are listed below.

- Most of the pumps that offered “E85” Flex Fuel were labeled as “minimum 70% ethanol,” which was not the case in 11 of the 20 survey samples analyzed (see Figure 2) and likely represents old labeling from 2010 or earlier, when D5798 set minimum ethanol content at 70%.
- While yellow color coding is common for MLEB dispenser nozzles and hoses, it is not universal. Four of the 20 stations did not have yellow dispenser nozzles and hoses for MLEB fuels.
- Six of the stations which offered a single MLEB alongside “E85” Flex Fuel, offered the two products from separate hoses.

- Three of the stations listed an octane number for the MLEBs that they offered.

Table 2 lists the MLEB offerings and blender pump configurations for each station sampled.

Table 2. Description of Blender Pump Station Configuration

Station #	MLEB offerings	Notes on Dispenser Configuration
1	E15, E30	E15 offered from the same hose as E30 and "E85" Flex Fuel
2	E15, E30	E15 offered from the same hose as E30 and "E85" Flex Fuel
3	E20, E30	E10 offered from the same hose as E20 and "E85" Flex Fuel
4	E30	Dedicated MLEB hose
5	E20, E30	Dedicated MLEB hose
6	E20, E30	Dedicated MLEB hose
7	E20, E30, E50	Dedicated MLEB hose
8	E20, E30	Dedicated MLEB hose
9	E30	Dedicated MLEB hose
10	E20, E30	Dedicated MLEB hose
11	NA	No MLEB was offered at this station
12	E20, E30	Dedicated MLEB hose
13	E20, E40	Dedicated MLEB hose
14	E20, E30	E10 offered from the same hose as E20, E30 and "E85" Flex Fuel
15	E30	Dedicated MLEB hose
16	E30	Dedicated MLEB hose
17	E15, E30	E15 offered from the same hose as E30 and "E85" Flex Fuel
18	E20, E30	Dedicated MLEB hose
19	E30	Dedicated MLEB hose
20	E30	Dedicated MLEB hose

Conclusions

In this work, 73 samples were collected from 20 separate blender pump stations located in the midwestern United States. Class 4 was targeted, with samples collected in February of 2013. This study was a follow-up to an earlier MLEB fuel survey (CRC E-95), which focused on Class 1 fuels. Samples were analyzed by Southwest Research Institute for ethanol content and vapor pressure. In addition detailed photographs of the stations were collected at the time of sampling. Key findings in this survey are listed below:

- For the E10 samples there was very little variation in ethanol content.
- For the MLEB samples variability in ethanol content was higher, typically failing to meet the advertised ethanol level by 3 to 4 vol%, and in one case was off by 10 vol%.
- One of the 20 "E85" Flex Fuel samples was above the allowable limits for ethanol content.
- Four of the 20 "E85" Flex Fuel samples had vapor pressure below the minimum requirement for Class 4.
- In general, there were many differences in the style and labeling of the dispensers surveyed in this study. Five of the 20 dispensers offered higher MLEBs (>E15) from the same hose as E10 or E15. These five dispensers create the potential for introduction of residual amounts of higher ethanol fuel than is acceptable in non-Flex Fuel vehicles.

Both the E-95 and E-95-2 study focused on MLEBs offered in the midwestern United States. Although the surveys were somewhat limited by where the stations were located, the goal was to find states with the highest number of stations, then sample a subset in each state. Thus, states with only one or two blender pumps were excluded from sampling.

The station locations in the previous study were rural, in areas that were not required to meet any of the footnotes in Table 4 in D4814, the gasoline specification. The footnotes in D4814 cover vapor pressure requirements during summer months for Federal ozone non-attainment areas, areas requiring reformulated gasoline, and/or areas that have state implementation plans for control of air quality. Future work may consider another summertime survey, particularly in areas where specific requirements are in place for gasoline, to determine if these gasolines have any impact on “E85” Flex Fuel properties compared to gasolines found in rural areas. Future work may also consider a wider distribution of sampling locations, including states where only one or two blender pumps may be located.

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Acknowledgments

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Appendix A: Station Photographs

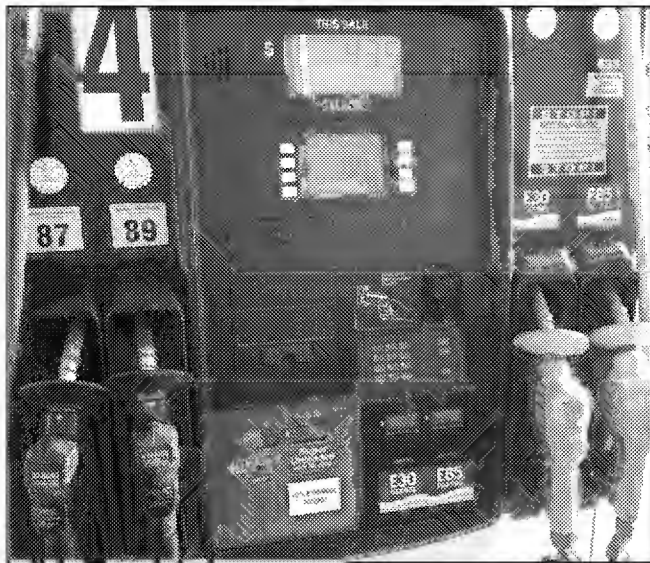


Figure A.1 Station #4



Figure A.2 Station #5

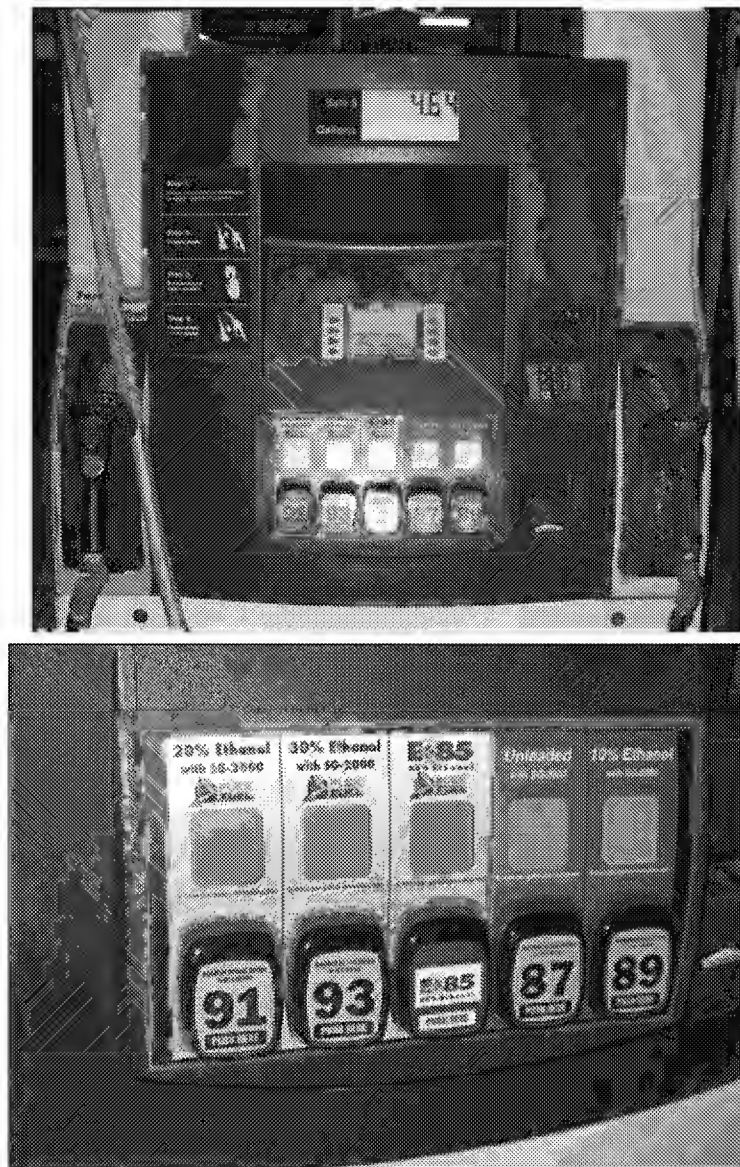


Figure A.3 Station #6



Figure A.4 Station #7



Figure A.5 Station #8

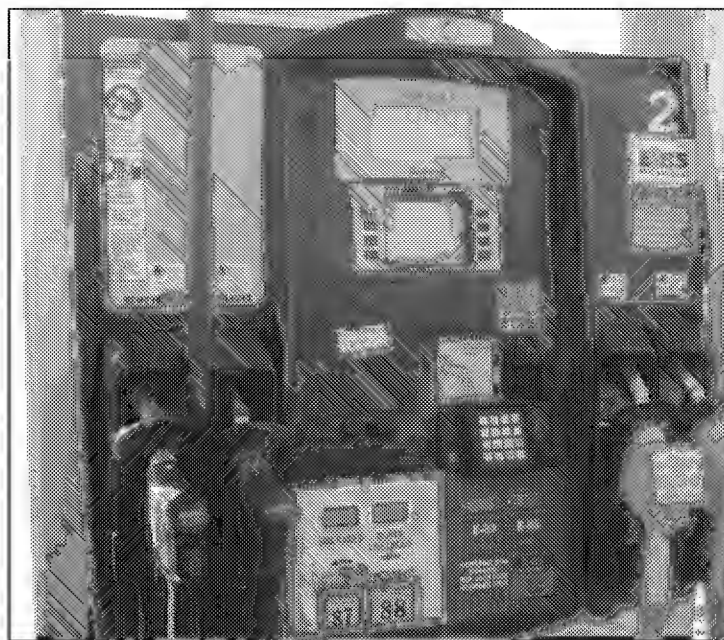


Figure A.6 Station #9

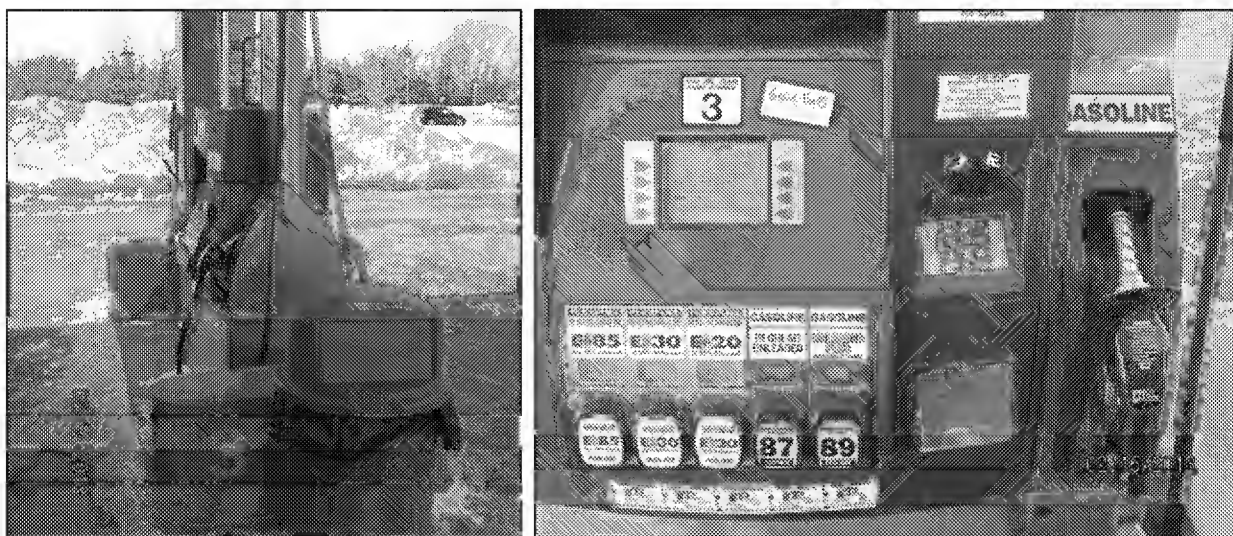


Figure A.7 Station #10



Figure A.8 Station #11

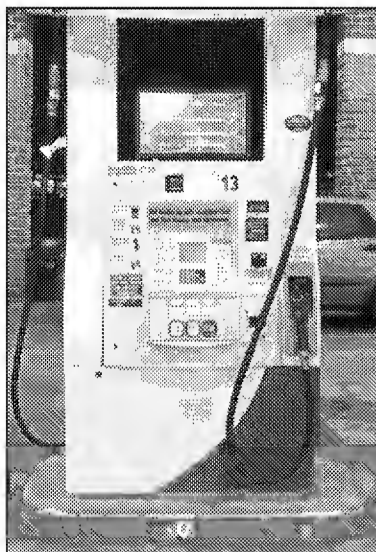


Figure A.9 Station #12

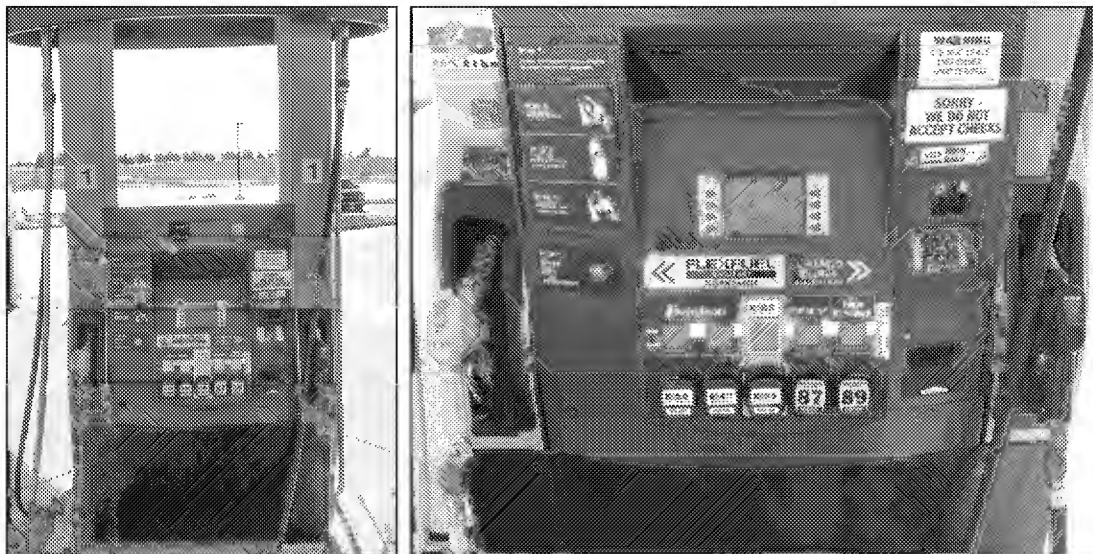


Figure A.10 Station #13

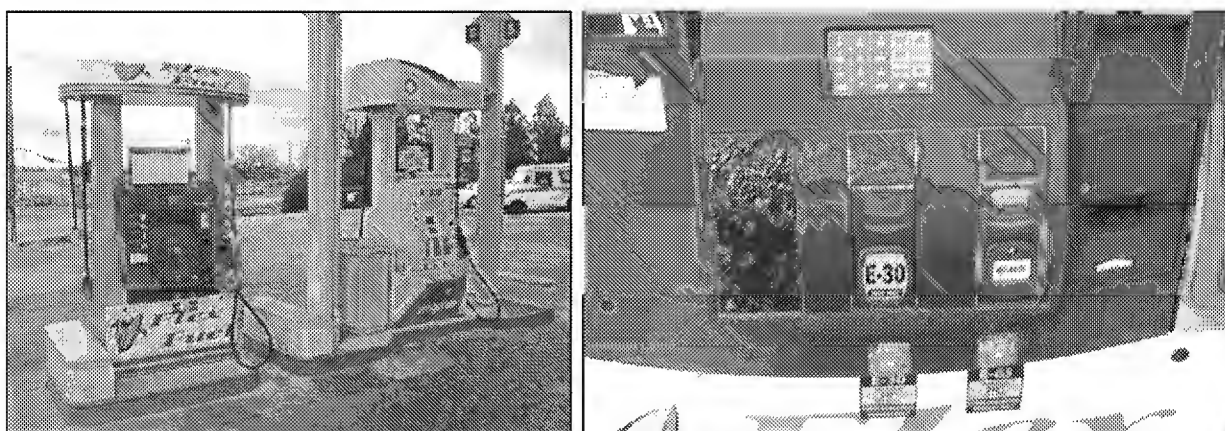


Figure A.11 Station #15



Figure A.12 Station #16



Figure A.13 Station #18

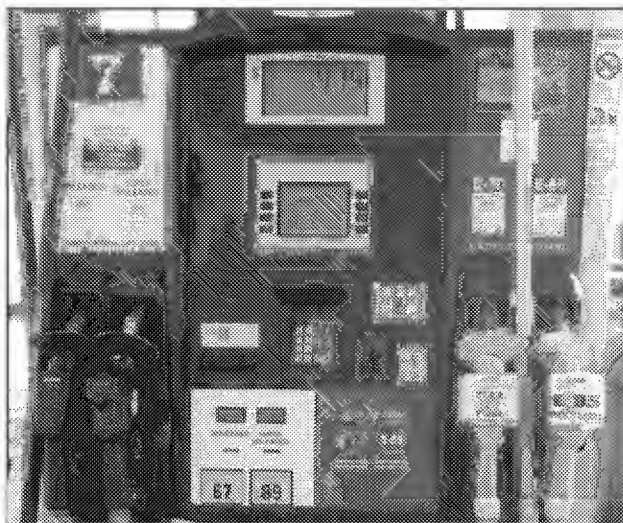


Figure A.14 Station #19

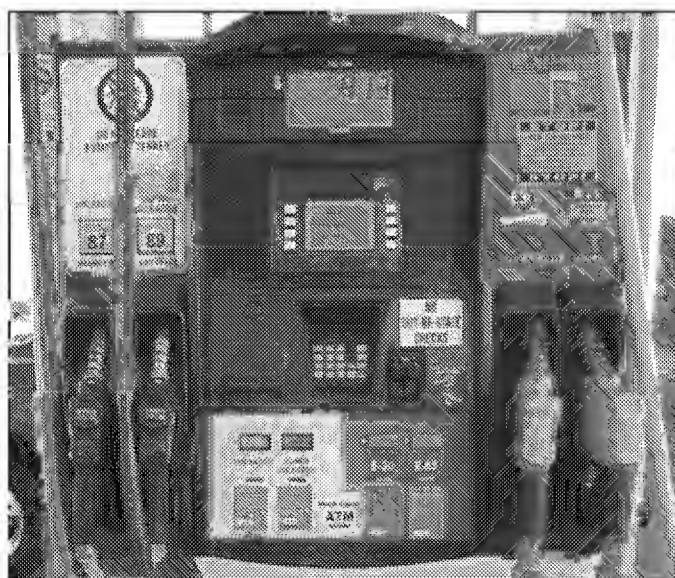


Figure A.15 Station #20

Appendix B: Tabulated Fuel Property Data

Table B.1 Fuel Properties

Station Number	Indicated Nominal	Ethanol Content (D5501/D5599) vol%	DVPE (D5191) psi	Water (D6304) vol%	SPGr@60F (D4052)
1	E85	63.9	10.9	0.63	0.77
1	E15	17.4	13.9		0.73
1	E30	30.2	13.5	0.35	0.74
1	E0	<0.1	13.6		0.72
2	E15	15.8	14.6		0.73
2	E30	28.6	13.7	0.33	0.74
2	E85	74.7	10.1	0.76	0.76
2	E10	10.3	14.8		0.73
3	E20	22.4	13.2	0.23	0.73
3	E85	82.7	7.2	0.80	0.78
3	E0	<0.1	13.1		0.72
3	E30	26.2	13.0	0.28	0.74
4	E85	69.9	9.7	0.72	0.77
4	E0	0.2	14.0		0.72
4	E30	27.4	13.7	0.29	0.74
5	E10	10.5	14.2		0.73
5	E85	64.2	10.9	0.57	0.76
5	E30	29.0	13.5	0.23	0.74
5	E20	15.7	14.1	0.17	0.73
6	E20	22.2	14.5	0.23	0.73
6	E0	<0.1	14.7		0.72
6	E85	93.9	4.7	0.81	0.79
6	E30	32.2	14.2	0.31	0.74
7	E30	22.0	14.5	0.33	0.74
7	E20	11.8	13.7	0.12	0.73
7	E10	10.3	14.9		0.73
7	E85	67.1	10.3	0.52	0.77
7	E50	44.2	13.1	0.44	0.75
8	E20	16.7	14.8	0.17	0.73
8	E10	10.3	15.2		0.73
8	E30	22.0	14.6	0.23	0.73
8	E85	67.6	11.8	0.72	0.75
9	E10	10.3	14.5		0.73
9	E85	65.8	10.5	0.62	0.77
9	E30	27.6	14.0	0.27	0.74

Station Number	Indicated Nominal	Ethanol Content (D5501/D5599) vol%	DVPE (D5191) psi	Water (D6304) vol%	SPGr@60F (D4052)
10	E0	<0.1	14.7		0.72
10	E85	66.6	10.5	0.63	0.77
10	E20	21.1	14.7	0.21	0.74
10	E30	25.7	14.4	0.25	0.74
11	E10	10.4	14.6		0.73
11	E85	69.6	11.6	0.56	0.75
12	E10	10.3	13.1		0.73
12	E20	17.9	12.9	0.18	0.73
12	E85	71.4	9.0	0.53	0.77
12	E30	25.4	12.6	0.23	0.74
13	E40	29.7	14.2	0.34	0.74
13	E0	0.1	14.6		0.72
13	E20	16.2	14.7	0.17	0.73
13	E85	67.0	10.8	0.66	0.77
14	E30	27.7	13.5	0.22	0.74
14	E20	19.6	13.5	0.15	0.73
14	E85	75.8	8.8	0.61	0.78
14	E0	0.3	13.3		0.72
15	E10	10.5	14.7		0.73
15	E30	26.4	14.4	0.27	0.74
15	E85	67.4	10.5	0.75	0.77
16	E85	71.3	9.4	0.76	0.78
16	E0	<0.1	13.7		0.73
16	E30	27.6	14.1	0.28	0.74
17	E30	27.8	13.2	0.26	0.73
17	E0	<0.1	14.3		0.72
17	E15	17.3	14.0		0.73
17	E85	74.5	10.3	0.58	0.76
18	E30	24.5	13.1	0.28	0.74
18	E10	10.2	13.3		0.73
18	E20	16.2	13.4	0.18	0.74
18	E85	67.6	10.7	0.40	0.77
19	E0	<0.1	10.7		0.73
19	E85	68.0	11.4	0.47	0.75
19	E30	24.6	11.7	0.26	0.74
20	E85	68.6	11.3	0.57	0.75
20	E30	25.5	11.3	0.19	0.74
20	E0	<0.1	10.7		0.73

ATTACHMENT 4

OVERVIEW –IMPACTS OF MID-LEVEL ETHANOL ON-ROAD AND NON-ROAD ENGINES AND EQUIPMENT (PREPARED BY DR. RON SAHU, MAY 15, 2009)

A. Change Due to the Enleanment Effect of Ethanol

Gasoline is a mixture of many hydrocarbon compounds that consist mainly of hydrogen and carbon.¹ Ethanol also contains hydrogen and carbon – but, in addition, it also contains oxygen. The exact air-to-fuel ratio needed for complete combustion of the fuel (to carbon dioxide and water vapor) is called the "stoichiometric air-to-fuel ratio." This ratio is about 14.7 to 1.0 (on weight basis) for gasoline. For ethanol/gasoline blends less air is required for complete combustion because oxygen is contained in the ethanol and because some of the hydrocarbons have been displaced. For example, for E10 the stoichiometric air-to-fuel ratio is 14.0 to 14.1 pounds of air per pound of fuel. Indeed, the stoichiometric air-to-fuel ratio for straight ethanol is 9 to 1 so that as the proportion of ethanol in the gasoline blend increases so must the air-to-fuel ratio decrease. To deliver the required power for any given operating condition, engines consume enough air and fuel to generate the energy required, to the limit of the engine's capabilities. Because fuel delivery systems are designed to deliver the prescribed amount of fuel on a volume control basis the fuel volume delivered is related to the volume of air introduced. The engine design anticipates that the fuel utilized will match the air-to-fuel ratio characteristics utilized in the engine design and calibration. Because ethanol blended fuels require more fuel for the same amount of air to achieve stoichiometric conditions, the fuel system must adapt by introducing more fuel or the desired mixture is not achieved. If additional fuel is not introduced to compensate for the ethanol the resulting mixture has less fuel than desired; the effect of this type of fuel change on an engine is called "enleanment."

¹ Sulfur, nitrogen, and trace elements also may be present.

Even with closed-loop systems, where the engine has a control system that can detect and compensate for the effects of ethanol addition (adapt), if the fuel contains an amount of ethanol that is outside the range of the system design, the engine similarly may receive too much oxygen and operate in a lean condition. Lean operation can lead to a variety of performance problems, for example the combustion and exhaust gas temperatures will be higher, engine starting may become more difficult, and the engine speed control may become inaccurate.² These problems may result in the unintentional engagement of cutting chains and blades on chainsaws and other products – because the engines driving these products will run at higher speeds, especially at idle conditions.

The increased combustion and exhaust gas temperatures resulting from lean operation can result in severe damages to pistons, gaskets, catalysts and emissions-related components, in turn, resulting in the failure of the product to operate and increased exhaust emissions.³ These increased temperatures can also damage and destroy critical safety components like spark arrestors – as required by the U.S. Forest Service to be used on chainsaws to reduce fire risks.

B. Effect on Exhaust Emissions

Enleanment and the increased heat from mid-level ethanol blends will cause heat-related damage to the engine over its useful life, which can cause dramatic increases in hydrocarbon emissions. NOx emissions from conventional products and vehicles generally increase

² Issues associated with driveability and operational problems have been discussed for on-road vehicles and for off-road equipment in a series of reports in 2002-2004 by Orbital Engine Company for a biofuels assessment conducted in Australia. In particular, see (a) A Testing Based Assessment to Determine Impacts of a 10% and 20% Ethanol Gasoline Fuel Blend on Non-Automotive Engines, January 2003; (b) Marine Outboard Driveability Assessment to Determine Impacts of a 10% and 20% Ethanol Gasoline Fuel Blend on a Small Batch of Engines, February 2003 and (c) A Testing Based Assessment to Determine Impacts of a 20% Ethanol Gasoline Fuel Blend on the Australian Passenger Vehicle Fleet – 2000hrs Material Compatibility Testing, May 2003.

³ Id.

immediately since enleanment creates conditions which increase NOx.⁴ For less sophisticated open-loop engines, NOx emission increases can be dramatic.

While some of the toxics in exhaust emissions show expected decreases in the presence of ethanol, some toxics, such as aldehydes, can show increases. Besides the potential toxic effects of aldehydes in exhaust gases, the aldehydes act as an ozone precursor and increase the smog-forming potential.

C. Effect on Water Solubility and Phase Separation

Separation of a single phase gasoline into a "gasoline phase" and a "water phase" can occur when too much water is introduced into the fuel tank. Water contamination is most commonly caused by improper fuel storage practices at the fuel distribution or retail level, or the accidental introduction of water during vehicle refueling. Water has a higher density than gasoline, so if water separates, it will form a layer below the gasoline. Because most engines obtain their fuel from, or near, the bottom of the fuel tank, engines will not run if the fuel pick up is in the water-phase layer.

Typically, gasoline can absorb only very small amounts of water before phase separation occurs. Ethanol/gasoline blends, due to ethanol's greater affinity with water, can absorb significantly more water without phase separation occurring than gasoline. Ethanol blends can actually dry out tanks by absorbing the water and allowing it to be drawn harmlessly into the engine with the gasoline. If, however, too much water is introduced into an ethanol blend, the water and most of the ethanol will separate from the gasoline and the remaining ethanol. The amount of water that can be absorbed by ethanol/gasoline blends, without phase separation, varies from 0.3 to 0.5 volume percent, depending on temperature, aromatics, and ethanol content.

⁴ The higher combustion temperatures and the excess of oxygen in the combustion chamber result in the excess oxygen combining with nitrogen to produce nitrogen oxides.

If phase separation were to occur, the ethanol/water mixture would be drawn into the engine and the engine would most likely stop.

In some situations, ethanol/gasoline blends might absorb water vapor from the atmosphere, leading to phase separation. Such problems are of greater concern for engines with open-vented fuel tanks that are operated in humid environments, such as marine engines.

Additionally, more complex phenomena such as lubricating oil/fuel separation (in 2-stroke engines) and temperature-induced phase separation of various fuel components have also been noted.

D. Effect on Material Compatibility

A variety of components in engine/equipment systems can come into contact with the fuel. These include

- Fuel Lines
- Fuel Tanks
- Fuel Pumps
- Fuel Injectors
- Fuel Rails
- Carburetors (and internal components)
- Pressure Regulators
- Valves
- O-Rings
- Gaskets

Materials used in these components should be compatible with the full range of expected fuel composition. Table A shows the types of metals, rubbers, and plastics that are used in existing engines and fuel system components currently designed to run on E10 fuel blends.

Table A – Illustrative Materials Used in Engines and Fuel Systems**Table A****A. Metals**

Aluminum (various grades)
 Brass
 Carbon Steel
 Cast Iron
 Copper
 Magnesium (and alloys)
 Zinc (and alloys)
 Lead
 Tin
 Terne Plate
 Solder (tin/lead)
 Other metals and alloys

B. Rubbers

Buna N
 Silicon Rubber (VMQ)
 HNBR (Hydrogenated Nitrile Butadiene Rubber)
 Others

C. Plastics/Polymers/Monomers/Elastomers

Hydrin (epichlorohydrin)
 H-NBR (copolymer from butadiene and acrylonitrile)
 Low Temp Viton (FKM) grades such as GFLT
 Nylons (various grades)
 Polyester urethane foam
 NBR with 16% PVC and 32% ACN content
 Ozo-Paracril (blend of PVC and nitrile rubbers)
 CSM - Chlorosulfonated polyethylene, such as Hypalon
 FVMQ - Fluorosilicone
 HDPE – High Density Polyethylene
 PS - Polysulfone
 PC - Polycarbonate
 ABS - Acrylonitrile Butadiene Styrene
 EVOH -Ethylene Vinyl Alcohol
 PPA - Polyphthalamide
 PBT - Polybutylene Terephthalate
 PE - Polyethylene – High Density Polyethylene (HDPE),
 PE - LDPE Low Density Polyethylene (LDPE)
 PET - Polyethylene Terephthalate (Mylar)
 PP - Polypropylene
 PPS - Polyphenylene Sulfide
 PUR - Polyurethane
 PVC - Polyvinyl Chloride
 PEI - Polyetherimide (GE Ultem)
 POM - Acetal Copolymer
 HTN - DuPont™ Zytel® HTN
 PTFE - Polytetrafluoroethylene (Teflon)
 POM - Polyoxymethylene (acetal/Delrin)
 Fluorosilicones

Others

This is not an exhaustive list and is meant as an illustration of the diversity of materials used presently. Based on existing studies, it is clear that several rubbers and elastomers can swell and deteriorate more rapidly in the presence of ethanol.⁵ Ethanol also corrodes certain metals. Corrosion occurs through different mechanisms including acidic attack, galvanic activity, and chemical interaction. The first is caused by water in the fuel. Ethanol attracts and dissolves water, creating a slightly acidic solution. Unlike gasoline, ethanol alone or combined with water conducts electricity; this conductivity creates a galvanic cell that causes exposed metals to corrode. So when ethanol is blended with gasoline the resulting blend is conductive and the conductivity increases as the amount of ethanol is increased. The addition of ethanol greatly increases the ability of gasoline to dissolve ionic impurities which can facilitate corrosive attack of many metals. Another mechanism is direct chemical interaction with ethanol molecules on certain metals.

Clearly, deterioration of materials would result in loss of function of critical engine components, resulting in fuel leaks, fires from fuel leaks, and equipment failure. This has obvious safety implications.

E. Effect on Evaporative Emissions

Permeation of fuel through elastomers can result in deterioration of these materials. In recent testing, all of the tested ethanol blends showed higher permeation rates through elastomers

⁵ A Testing Based Assessment to Determine Impacts of a 20% Ethanol Gasoline Fuel Blend on the Australian Passenger Vehicle Fleet – 2000hrs Material Compatibility Testing, May 2003 and A Testing Based Assessment to Determine Impacts of a 10% and 20% Ethanol Gasoline Fuel Blend on Non-Automotive Engines - 2000hrs Material Compatibility Testing, May 2003.

than conventional gasoline.⁶ An important emissions concern that remains poorly understood is ethanol's ability to permeate through rubber, plastic, and other materials used widely in the fuel tank, fuel system hoses, seals, and other parts of the fuel handling system. Recent studies have shown these emissions can be quite significant.⁷

F. Impacts Associated with Fuel Volatility

Mid-level ethanol gasoline blends are documented as causing the following operating problems resulting from their different volatility and vaporization characteristics. First, because ethanol has a lower vapor pressure, it has been shown to cause starting problems because there is inadequate vapor pressure to a vapor mixture rich enough to ignite. In turn, such problems could result in consumer tampering of the engine's carburetor.

Second, because ethanol vaporizes at lower temperatures than gasoline, mid-level ethanol can cause "vapor lock." Vapor lock is a condition where the fuel in the engine's fuel delivery system vaporizes preventing the transport of liquid fuel to the carburetor or fuel injectors. Increasing the ethanol concentration beyond E10 is likely to increase the likelihood of vapor lock for open loop fuel control system engines typically used on older vehicles and most off-road engines. Even in the closed loop engine systems used in some off-road engines and in most late-model vehicles, there remains the likelihood of vapor lock.

Other concerns about low temperature fuel characteristics of ethanol blends include a) increased viscosity of ethanol/gasoline blends which may impede fuel flow and b) phase separation in the vehicle fuel system due to reduced water solubility.

⁶ (a) See EPA-420-D-06-004, Draft Regulatory Impact Analysis: Control of Hazardous Air Pollutants from Mobile Sources, Chapter 7, February 2006. (b) See also, Fuel Permeation from Automotive Systems: E0, E6, E10, E20, and E85, Final Report, CRC Project No. E-65-3, December 2006.

⁷ See, e.g., the CRC E-65-3 Project Report referenced earlier as well as the EPA document referenced earlier which also discusses testing conducted by the California Air Resources Board.

G. Summary of Impacts

The effects of increased ethanol in gasoline are generally not linear with the amount of oxygen in the fuel. Hence, the effects of increasing the ethanol content beyond E10 on current engines are not fully known. Table B presents an overview of all these effects and how they can influence emissions, performance, and durability, mainly for automobiles; but, in some instances, the effect of increased ethanol on less sophisticated off-road engines is also noted.

Table B
Properties of Ethanol And Associated Implications

<i>Property</i>	<i>Implication</i>
Hydrogen Bonding/Vapor Pressure	This makes pure ethanol have a very low vapor pressure compared to gasoline. But it also means the vapor pressure of a mixture can be higher than the gasoline alone. Where the peak vapor pressure occurs depends on the base gasoline vapor pressure and ethanol concentration. With a 9 RVP base gasoline, the peak occurs at around 6-7% by volume. ⁸ Vapor pressure directly affects the evaporation rate and potential hydrocarbon emissions.
Hydrogen Bonding/Water Attraction	Easy hydrogen bonding makes ethanol attract water. The presence of water, in turn, increases the risk that certain metals will corrode. This becomes a problem when fuel remains in storage (including vehicle fuel tanks) and handling systems for a long time.
Oxygen Atom	Ethanol's oxygen atom lowers its energy content, which reduces fuel economy. A blend's final energy content and the impact on fuel economy depends on the amount of ethanol and gasoline density. Most blends up to 10% ethanol by volume do not affect fuel economy to a significant extent (about 1-3%).
Oxygen Atom	Ethanol mixed with gasoline makes the air-to-fuel ratio leaner than with gasoline alone. Controlling the air-to-fuel ratio is critical to the combustion process and engine performance. Performance problems include hesitation, stumbling, vapor lock, and other impacts on drivability. Pre-ignition also can occur, causing engine knock and potential damage. Ambient temperature and pressure are important factors.
Oxygen Atom	Manufacturers calibrate the oxygen sensors (used in modern vehicle technologies but not in off-road equipment, in general) to recognize specific levels of oxygen in the exhaust stream. If a mixture is outside the calibration range, the sensor will send inaccurate signals to the air-to-fuel feedback and on-board diagnostic systems. This could cause improper air-to-fuel ratios as well as an increased risk of causing one of the dashboard's warning lights (MIL) to illuminate.
Higher Combustion Temperature	This increases the formation of NO _x , an ozone precursor, in the exhaust gas. Modern three-way catalysts in vehicles reduce NO _x by more than 99%, except before the catalyst fully warms up (i.e., during cold-start engine operation). Excessive combustion temperatures also can cause engine damage.
Higher Latent Heat of Vaporization	This can delay catalyst "light-off," which is period of time before the catalyst warms up and can reduce exhaust emissions of HC, CO, and NO _x .
Higher Electrical Conductivity	This property increases galvanic corrosion of metals.
Permeability	Ethanol readily permeates at significant rates through elastomers, plastics, and other materials used widely for hoses, o-rings, and other fuel system parts. Depending on temperature and the materials used in the fuel system, this can significantly increase

⁸ See API Publication 4261, June 2001

	hydrocarbon emissions.
Solvency	Under certain conditions, the presence of ethanol can cause certain detergency additives to precipitate out of solution, leaving the engine unprotected from gummy deposits. Deposits can increase emissions, lower fuel economy, and increase drivability problems.
Polarity or Oxygen Atom	Ethanol lowers fuel lubricity by binding to metal surfaces and displacing motor oil. This effect increases cylinder bore wear.
Solvency	Ethanol is an effective solvent that mixes readily with both polar and non-polar chemicals. This property allows ethanol to dissolve some adhesives used to make paint adhere to vehicle bodies. Ethanol also dissolves certain resins and causes them to leach out of the fiberglass fuel tanks used in some boats. Not only does this cause the tank to deteriorate, it also creates a sludge that coats the engine and can cause stalling and other performance problems. ⁹

⁹ See "Important News for Boat Owners," at www.ethanolrfa.org.

H. Ethanol-Compatible Design

It is instructive to review the types of changes that have been made in certain automobiles to handle greater than E10 fuels. Table C, below, shows the types of changes that have been made in Brazilian vehicles in order to accommodate higher ethanol blends.

Table C
Adaptation of Brazilian Vehicles¹⁰ for Use with E22 or E85+¹¹

System	Part Change
Air-Fuel Feed	Electronic fuel injectors: must use stainless steel and modify the design to improve fuel "spray" and throughput. Manufacturers calibrate the system to the fuel, to ensure the proper air-to-fuel ratio and an appropriate Lambda sensor working range.
	Carburetors: must treat or otherwise protect aluminum or zinc alloy surfaces.
Fuel Handling System	Fuel pumps: must protect internal surfaces and seal connectors; a different metal may be required.
	Fuel pressure regulators: must protect internal surfaces; internal diaphragm may need to be up-graded.
	Fuel filter: must protect internal surfaces and use an appropriate adhesive for the filter element.
	Fuel tank: if metallic, must protect (coat) the internal surface. If plastic, may need to line the interior to reduce permeation.
	Fuel lines and rails: may need to coat steel parts with nickel to prevent corrosion or replace with stainless steel.
	Fuel line quick connects: must replace plain steel with stainless steel.
	Hoses and seals: "o-ring" seals and hoses require resistant materials.
Emission Controls	Vapor control canister: may need to increase the size of the canister and recalibrate it for the expected purge air flow rate.
	Catalyst: may need to adjust the kind and amount of catalyst and wash coating.
Powertrain	Ignition System: must recalibrate ignition advance control.
	Engine: should use a higher compression ratio for proper operation; new camshaft profile and phase; and new materials for the intake and exhaust valves and valve seats.
	Intake manifold: must be able to deliver air at a higher temperature; requires a new profile and must have a smoother surface to increase air flow.
	Exhaust pipe: must protect (coat) the internal surfaces and ensure design can handle a higher amount of vapor.
Other	Fuel filler door paint: must change paint formula used on plastic fuel filler door to avoid loss of paint adhesion.
	Motor oil: may require reformulation and/or a new additive package.
	All parts that might be exposed to the fuel: avoid polyamide 6.6 (nylon), aluminum, and various zinc alloys. If these materials are used, their surfaces must be treated or otherwise

¹⁰ Brazil's vehicle emission standards are less stringent than those in the U.S., so U.S. vehicles may require additional effort and calibration to meet emission and durability standards.

¹¹ "Fuel Specifications in Latin America: Is Harmonization a Reality?" Henry Joseph Jr., ANFAVEA (Brazilian Vehicle Manufacturers Association), presented at the Hart World Fuels Conference, Rio de Janeiro, 21-23 June 2004.

	protected.
	Vehicle suspension: may need to modify to accommodate a higher vehicle weight
	Cold start system (for E85 or above): may require an auxiliary start system with its own temperature sensor, gasoline reservoir, extra fuel injector, and fuel pump; also, the vehicle battery must have a higher capacity.

For automobiles designed to handle greater than E10, the changes involve the use of innovative and ethanol-compatible technologies, material changes, and adjustments in calibration. In all cases, one cannot adapt or retrofit existing products because too many parts and design steps are involved and the product may have size constraints. Necessary modifications must occur during design and production to ensure compliance with strict emission standards and to meet consumer expectations for safety, durability, performance, and cost.

To ensure materials compatibility at higher ethanol levels for use with flexible fuel vehicles (FFVs), manufacturers use corrosion resistant materials in any part that may contact fuel. For example, Brazilian auto manufacturers, who have considerable experience producing ethanol-compatible vehicles, recommend using electronic fuel injectors made with stainless steel, larger holes, and modified designs to improve fuel spray. Significant changes to the fuel pump and fuel pump motor are also often needed. Similarly, manufacturers of carbureted engines—for example, almost all small engine products such as chain saws and lawn mowers, as well as older and antique vehicles—recommend, among other steps, coating or anodizing aluminum carburetors or substituting a different metal not susceptible to attack.

Boats have similar compatibility concerns. Many, for example, use aluminum fuel tanks that are susceptible to corrosion. While sacrificial zinc anodes often are added later to the external parts of these tanks, they are not feasible for the tank's interior.¹² Older yachts with fiberglass tanks have a different problem. Ethanol can chemically attack some of the resins used

¹² NMMA Ethanol Position Paper, no date, available at www.nmma.org/government/environmental/?catid=573.

to make these tanks causing them to dissolve. In doing so, the ethanol causes leaks, heavy black deposits on marine engine intake valves, and deformation of push rods, pistons, and valves.¹³

Conventional vehicles and products do not have these material adaptations for higher level ethanol use. One device particularly difficult to address after-the-fact is the fuel tank level sensor. These sensors, which are placed inside the fuel tank, directly expose wiring to the fuel. Depending on how much ethanol these devices contact and for how long, galvanic or electrolytic corrosion would be expected to dissolve the wires and eventually cause device failure.

Manufacturers make additional design changes to address emissions and performance needs.¹⁴ In this context, it is important to remember that U.S. emission standards are more stringent than those in Brazil. For U.S. vehicles, manufacturers select oxygen sensors and onboard diagnostic (OBD) systems specifically to cover the expected range of oxygen in the exhaust gas. If the fuel ethanol pushes the exhaust oxygen content outside the range of the oxygen sensor, the vehicle's OBD system won't work properly and may erroneously illuminate or fail to illuminate the dashboard warning light. In addition, manufacturers must calibrate vehicle and product systems to the expected fuel to ensure the proper air-fuel ratio for both emissions and performance purposes. In the U.S., off-road engines are also regulated for emissions regardless of their size or equipment that they power. Generally, the off-road engines do not utilize oxygen sensors and computer controls to adjust fuel delivery by a closed loop system. In many products, emission compliance has dictated air-to-fuel ratio controls that are a delicate balance between being too rich and, therefore, out of compliance, or too lean, resulting in performance or durability problems.

¹³ Id.

¹⁴ "Fuel Specifications in Latin America: Is Harmonization a Reality?" Henry Joseph Jr., ANFAVEA (Brazilian Vehicle Manufacturers Association), presented at the Hart World Fuels Conference, Rio de Janeiro, 21-23 June 2004.

The long term durability of emission control systems is a critical issue, with current U.S. federal and California emission standards requiring on-road vehicles to comply for up to 150,000 miles and off-road engines to comply for full useful life periods. If the control system of the vehicle was not designed to accommodate the leaning effect of ethanol, the vehicle's catalyst protection routine will be disabled. For off-highway engines, or older vehicles without closed loop systems, the enleanment influence can result in higher exhaust gas temperatures. This can cause thermal degradation of the catalyst over time, either through sintering of the precious metal wash-coat or damage to the substrate and can also degrade critical engine components such as pistons and exhaust valves.

ATTACHMENT 5

**Preliminary Comments
on the report titled
*"Effects of Intermediate Ethanol Blends on Legacy Vehicles and Small Non-Road Engines,
Report 1 – Updated," NREL/TP-540-43543 and ORNL/TM-2008/117, dated February 2009***

Dr. Ron Sahu, Consultant to the Outdoor Power Equipment Institute (OPEI)

These comments focus exclusively on major adverse impacts observed during the tests performed on Small Non-Road Engines (SNRE), including lawn, garden and forestry products, like lawnmowers and trimmers.

I. THE TESTS DOCUMENT THE FOLLOWING MAJOR ADVERSE IMPACTS RESULTED FROM FUELS GREATER THAN 10% ETHANOL

A. Engine exhaust temperatures rose significantly. Significant rises in temperatures (exhaust, cylinder head, etc.) occurred on the order of 20 to 70 C from engines run on E0 compared to E20. For several categories, significant temperature rises resulted between E10 and E15. Additional heat generation has obvious implications on increased burn and fire hazards – considering the proximity of cut grass, wood chips and the operator to the engine's hot exhaust. However, the report does not delve into the implications of the additional heat and its ramifications on engine and equipment failure, personnel safety, increased fire hazards, or the inability to mitigate any of these hazards on millions of pieces of legacy equipment.

B. Risks to operators dramatically increased. The report recognizes that unintentional clutch engagement resulted on several tested products because of high idle speeds. Obviously significant risks are created when a chainsaw blade becomes engaged when the product should be idling. However, there is no discussion in the Report of this increased hazard. If anything, the mitigation proposed (i.e., adjustment of fuel air mixture enleanment) is

unworkable and may even be illegal “tampering” under the EPA regulations. It is certainly not feasible to adjust carburetors on millions of legacy equipment that are already in use.

C. Damage to Engines. Both of the tested “Residential Handheld Engines” (engines B-3 and B-7 as shown in Figure 3.9, pp. 3-18) suffered total and complete failures and would not start or operate after running on E-15 fuel for 25 or less hours, which is less than half of their useful life.

D. Operational Problems. Many of the engines tested on mid-level ethanol suffered from erratic equipment operation, “missing” and stalling of engines, and power-reduction.

II. MISCHARACTERIZATION OF RESULTS IN THE EXECUTIVE SUMMARY

The Executive Summary does not accurately summarize the scope, results as well as uncertainties associated with the testing. Since most of the policy-makers will focus only on the Executive Summary, this could result in misinformed policies based on misleading conclusions.

There appear to be numerous, material inconsistencies in the manner in which the results are reported in the main body of the report versus in the Executive Summary, including the following examples:

A. The Executive Summary merely notes three handheld trimmers experienced higher idle speeds and unintentional clutch engagement. (See Sec. E.5.2). The report recognizes that this same problem could also occur on chainsaws. (See Sec. 3.2). The implications of unintentional clutch engagement in chainsaws and hedgeclippers (which are both examples of

close-to-the-body, sharp-bladed equipment) are obvious and alarming; this substantial problem should have been fully addressed in the Executive Summary.

B. With regards to materials compatibility, the Executive Summary incorrectly concludes that "...no obvious materials compatibility issues were noted..." (see p. xix). In fact, the report itself recognizes that materials incompatibility (such as swelling of the elastomeric seat for the needle in the carburetor bowl) could be the cause of the engine stall for the Briggs and Stratton generator observed in the pilot study (see pp. 3-15). The report also states that: 1) "...various fuel-wetted materials in some small engines may not be compatible with all ethanol blends..." (see p. 3-9); and 2) "...materials compatibility issues...were not specifically characterized as part of the study..." (see p. 3-12).

C. Engines in the study experienced "unstable governor operation," "missing" and "stalling" when operating on E20 fuel, indicating unacceptable performance. (See Section 3.2.2). However, the Executive Summary omitted any discussion of these substantial problems.

D. Discussing emissions, the Executive Summary simply notes that HC emissions "generally decreased" and that combined HC+NOx emissions "decreased in most instances." (See p. xix). However, the report notes that while HC emissions generally decreased, they also increased in some engines. The net change in HC+NOx emissions ranged from -36% to +41% as reported in Sec. 3.2.2. It is important to note that for new engines, the net change in HC+NOx was often greatest in going from E0 to E10 and smaller in the other transitions (i.e., from E0 to E15 or E0 to E20). (See Table 3.7). For example, the numerical average for all engines shows that the HC+NOx reduction was -16.6% from E0 to E10; -13.5% from E0 to E15 and only -9.5% from E0 to E20. Since small engines are already capable of E10 operation and that fuel is

already available, this data indicates that transitioning to E15 and E20 may actually increase HC+NO_x from E10. (As a side note, what is actually measured as HC in the study is unclear since a FID was used for this purpose, uncorrected for any ethanol or aldehydes, as noted in the report).

III. DEFICIENCIES IN THE TESTING PLAN AND SCOPE

A. No emissions testing pertaining to evaporative emissions was conducted. Thus, all references to “emissions” means tail-pipe emissions from the engine. Evaporative emissions are now regulated by EPA for small engines and equipment and covered by the EPA “certification” program. Lack of evaporative emissions is a major omission.

B. The report does not contain any direct data on “materials compatibility” testing or results – i.e., involving the various fuels tested and the materials that may be exposed to these fuels and how they interact. Material compatibility is a significant concern with E15 and E20 fuels when used in small engines, leading not only to “operational issues” but also to durability, emissions, and safety impacts.

C. The report notes that the following fuels were used: E0, as well as splash-blended E10, E15, and E20. However, the report does not contain the actual ASTM specification of the blended fuels, including all relevant properties such as distillation cut point temperatures, etc. Table 2.2 of the report contains a few parameters of the blends. This is incomplete and a more complete fuel specification should be provided. The executive summary concludes that “...the different fuel characteristics of match-blended and splash-blended fuels were not expected to have a significant impact on temperature” or on durability. (See p. xviii). However, there is not any cited technical support for these statements. Similarly, there is no support for the

observation that "...emission results...are not expected to vary significantly...between splash-blended and match-blended fuels." *Id.*

D. As the report notes, neither cold-start, nor warm-up testing was done, although these are two very common modes of operation for many categories of small engines. Additional performance tests that impact "operational issues" which should have been tested include: (i) acceleration; (ii) application performance; (iii) carburetor and breather icing; (iv) fuel consumption; (v) governor stability; (vi) load pick up; and (vii) vapor lock. Individual categories of small engines will likely have additional performance-related test requirements.

E. As the Executive Summary notes, the report presents "initial results...focused on identifying emissions or operational issues and measurement of several key engine temperatures..." (See p. xviii). It is not clear what is meant by "operational issues" or what quantitative surrogates and/or metrics were used to substitute for operational issues. It appears that erratic operation, high idle, stalling, etc. were used as evidence of operational issues. While these are undeniably evidence of operational issues, no testing appears to have been done on various actual equipment operational modes (as discussed later) so the full extent of operational issues has by no means been evaluated.

F. The report does not fully flesh out the issue and implications of irreversibility – i.e., once exposed to E15 and/or E20, performance is not restored simply by reverting to E0. In the case of the Poulan weedeater, it is noted that there were poor operations with E15 and E20 and that "normal operation could not be restored on E0." (See Section 3.2.2). This is significant. Actual users, when faced with operational problems with ethanol blended fuels, will, as common

sense dictates, revert to E0. What they will find is that doing so will not “unring the bell” since the damage by the ethanol blends is not reversible simply by changing the fuel.

IV. UNREPRESENTATIVE AND LIMITED NUMBER OF TESTS CONDUCTED

A. The category of forestry, lawn and garden equipment includes a broad swath of equipment and engine types. Yet, the category has not been defined in the report so that the extent of test results presented can be judged in context. While noting that millions of products with small engines are sold each year (actually tens of millions), and that EPA certifies on the order of 900 engine emission families, the report does not cover the immense diversity of the category including: 1) the various engine and equipment types used, 2) the fuel delivery mechanisms, 3) the various sizes and functions of the equipment, 4) the constraints that the equipment operate under (such as close proximity to operators, as an example), and 5) many other characteristics. Engines in this product category utilize a wide variety of engine architecture including both single and twin cylinders, two cycle and four cycle combustion, ported and valve charge controlled, side valve and overhead valve orientations, with and without exhaust after-treatment, governed load and product load controlled, etc. The report should clearly qualify its findings are based on a tiny fraction of the diverse population of affected products.

B. The types and numbers of engines and equipment tested are inadequate to be representative of even the limited types of small engines that were the subject of testing. While practical constraints such as time and money will always constrain the amount of testing that can be done, the basis for choosing the engine and equipment – namely those found in “...popular, high sales volume equipment...” appears not to have been followed. For example, of the six pieces of equipment selected for the pilot study, four were generators. No chainsaws were

tested, even though the OPEI had directly requested that they be included – because of their extreme operating conditions and sensitivity to mid-level ethanol. Also, it is explicable why only one residential hand-held engine would be tested, even though these are likely to be very sensitive to fuel changes. The report should provide the basis of selection rather than referencing unspecified EPA sources. One of the constraints also seems to have been the available laboratory equipment (i.e., lack of small engine dynamometers). This is clearly an inappropriate basis for constraining equipment selection, especially if the goal is to obtain data on the entire class of affected engines and products.

C. The report rightly notes the challenges associated with multi-cylinder engines – although characterizing these as being “more sensitive” is too vague. (See p. 3-11). It is unfortunate that while the study included one twin cylinder engine in the initial screening process, there were no twin cylinder engines included in the more in depth portions of the testing program. Particularly when the initial screening test clearly demonstrated significant influences of higher ethanol blends. A significant portion of the Class 2 (>225 cc) non-handheld engines produced each year are two cylinder engines. The omission of these engines in the expanded program is puzzling. The detailed test program should include engines and equipment that demonstrated any significant influence during the screening tests.

D. The limited number of tests conducted cannot provide assurances that the results presented have any statistical significance, where appropriate. In fact, no attempt is made to discuss results in terms of statistical significance. Nor are such issues discussed in support of the design of the test matrix itself. For example, no pair-wise tests were run or results reported even though those opportunities were available even with the limited equipment selection.

E. The manner in which the tests were run makes it difficult to separate the effects of engines, fuels, and aging. For example, the full-life tests do not allow the ability to distinguish between fuel-driven and engine-driven causes since only one engine was tested on each fuel. In the pilot study, the effects of the fuel and aging are similarly hard to separate. These types of issues could have been avoided with better test planning.

V. OTHER COMMENTS

A. The comments are preliminary because not all of the test data discussed in the report are included. Specifically, backup test data for all tests conducted by the Dept. of Energy (NREL and ORNL) and its contractors (TRC) still need to be provided.

B. The report notes that the test plan was developed with close consultation involving, among others, "...US automobile companies, engine companies, and other organizations..." It would be helpful to have details of all the companies and individuals consulted in an Appendix to the report.

C. The report does not separately discuss the comments of the peer reviewer(s) and what changes were made to the draft report as a result. While the Acknowledgements note that the peer review panel was led by Joseph Colucci, the report does not contain a list of all peer reviewers used, what portions of the report were peer reviewed by whom, and the necessary vitae for the reviewers. This should be included.

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Biographical Sketch

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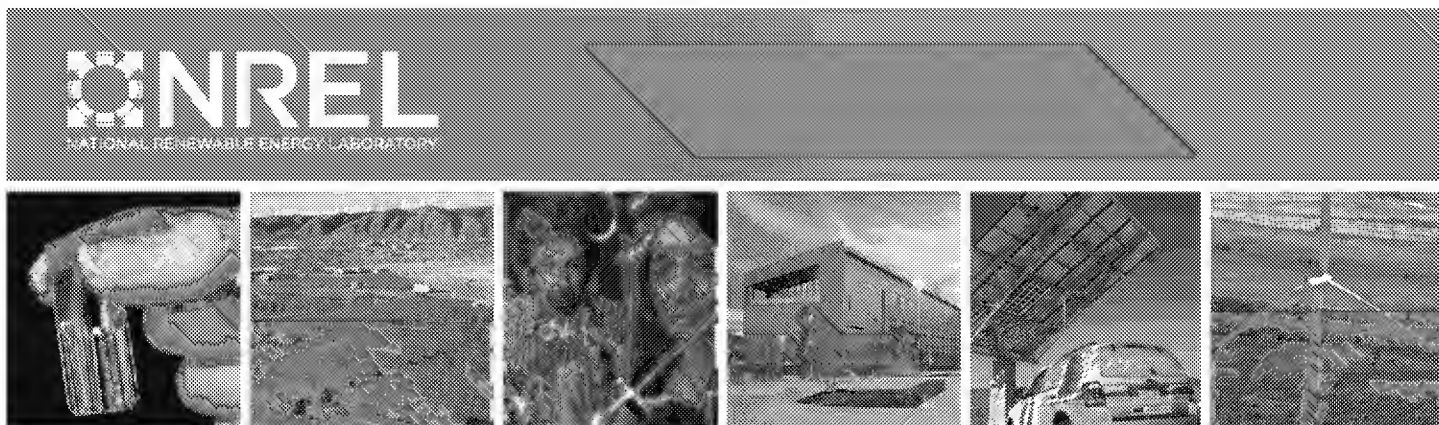
He has over fifteen years of project management experience and has successfully managed and executed numerous projects in this time period. This includes basic studies and applied research projects, design projects, regulatory compliance projects, permitting projects, energy studies, risk assessment projects, and projects involving the communication of environmental data and information to the public.

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Dr. Sahu has and continues to provide expert witness services in a number of environmental areas discussed above in both state and federal courts as well as before administrative bodies.

ATTACHMENT 6



High Ethanol Fuel Endurance:

A Study of the Effects of Running Gasoline with 15% Ethanol Concentration in Current Production Outboard Four-Stroke Engines and Conventional Two-Stroke Outboard Marine Engines

June 16, 2010 – June 30, 2011

David Hilbert
Mercury Marine
Fond du Lac, Wisconsin

NREL is a national laboratory of the U.S. Department of Energy, Office of Energy Efficiency & Renewable Energy, operated by the Alliance for Sustainable Energy, LLC.

Subcontract Report
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NREL Technical Monitor: Keith Knoll
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Mercury Marine Product Development and Engineering

High Ethanol Fuel Endurance

A study of the effects of running gasoline with 15% ethanol concentration in current production outboard four-stroke engines and conventional two-stroke outboard marine engines.

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Executive Summary

Objective:

The objective of this work was to understand the effects of running a 15% ethanol blend on outboard marine engines during 300 hours of wide-open throttle (WOT) endurance – a typical outboard marine engine durability test. For the three engine families evaluated, one test engine each was endurance tested on E15 fuel with emissions tests conducted on both E0 and E15 fuel, while a second control engine was emissions and endurance tested on E0 fuel for each engine family.

Summary of Results:

Results are based on a sample population of one engine per test fuel. As such, these results are not considered statistically significant, but may serve as an indicator of potential issues. More testing would be required to better understand the potential effects of E15.

9.9HP Carbureted Four-Stroke:

- The E15 engine exhibited variability of HC emissions at idle during end-of-endurance emissions tests, which was likely caused by lean misfire.
 - Both the E0 control engine and E15 test engine ran leaner at idle and low speed operation at the end of endurance testing compared with operation at the start of the test.
 - The trend of running lean at idle coupled with the additional enleanment from the E15 fuel caused the E15 engine to have poor run quality (intermittent misfire or partial combustion events) when operated on E15 fuel after 300 hours of endurance.
 - CO emissions were reduced when using E15 fuel due to the leaner operation, as expected for this open-loop controlled engine.
- The E15 engine exhibited reduced hardness on piston surfaces based on post-test teardown analysis.
 - The exhaust gas temperature increased 17°C at wide open throttle as a result of the leaner operation when using E15 fuel. Higher combustion temperatures may have caused observed piston hardness reductions. Lack of pre-test hardness measurements prevented a conclusive assessment.
- Several elastomeric components on the E15 engine showed signs of deterioration compared with the E0 engine.
 - Affected components were exposed to E15 fuel for approximately 2 months; signs of deterioration were evident.

300HP Four-Stroke Supercharged Verado:

- The E15 engine failed 3 exhaust valves close to the end of the endurance test.
 - Metallurgical analysis showed that the valves developed high cycle fatigue cracks due excessive metal temperatures.
- The pistons on the E15 engine showed indications of higher operating temperatures compared to the E0 engine's pistons as evidenced by the visual difference in carbon deposits.
- The E15 engine generated HC+NO_x values in excess of the Family Emissions Limit (FEL) when operated on E15 fuel, but did not exceed that limit when operated on E0 emissions certification fuel.

- The primary contributor to this increase in exhaust emissions was NO_x due to enleanment caused by the oxygenated fuel.
- CO emissions were reduced when using E15 fuel due to leaner operation, as expected for this open-loop controlled engine.

200HP EFI 2.5L Two-Stroke:

- The 200 EFI two-stroke engine showed no signs of exhaust emissions deterioration differences due to the fuel.
 - The E15 fuel caused the engine to run lean resulting in reduced HC and CO emissions. NO_x was of little concern on this type of engine since NO_x accounted for less than 2% of the total regulated HC+NO_x emissions.
- The E15 engine failed a rod bearing at 256 hours of endurance, which prevented completion of the 300 hour durability test.
 - Root cause of the bearing failure was not determined due to progressive damage.
 - More testing would be necessary to understand the effect of ethanol on oil dispersion and lubrication in two-stroke engines where the fuel and oil move through the crankcase together.

4.3L V6 EFI Four-Stroke Catalyzed Sterndrive:

- Since E15 fuel was readily available in the test facility and an engine equipped with exhaust catalysts was on the dynamometer, emissions tests were conducted on a 4.3L V6 sterndrive engine to better understand the immediate impacts of ethanol on this engine family.
 - At rated speed and load (open-loop fuel control) E15 caused exhaust gas temperatures to increase by 20°C on average and the catalyst temperatures to increase by about 30°C.
 - More rapid aging of the catalyst system occur due to the elevated catalyst temperature when considering the high load duty cycle typically experienced by marine engine applications.

Conclusions and Recommendations:

Several issues were discovered in this study from an exhaust emissions and an engine durability standpoint as a result of running E15 fuel in outboard marine engines. Run quality concerns were also identified as a result of the lean operation on the carbureted engine.

Additional investigation is necessary to more fully understand the observed effects and to extrapolate them to all types of marine engines over broader operating conditions. Effects on operation at part load, transient acceleration/deceleration, cold start, hot restart, and other driveability-related concerns need to be evaluated. This test program was mainly testing for end-of-life durability failures, which would not likely be the first issues experienced by the end users. A customer would likely be affected by run quality/driveability issues or materials compatibility/corrosion issues before durability issues. The wide range of technology used in marine engines due to the wide range of engine output will complicate this issue (Mercury Marine produces engines from 2.5HP-1350HP).

More testing is needed to understand how ethanol blends affect lubrication systems in two-stroke engines that have fuel and oil moving through the crankcase together. Crankcase oil dispersion is the only mechanism by which two-stroke engines of this architecture provide lubrication at critical interfaces such as bearings and cylinder walls. Ethanol may have an effect on the dispersion or lubricity of the oil.

A better understanding of how long term storage affects ethanol blends in marine fuel systems would require more real-world testing. Marine vessels often go through long periods of storage that could affect the fuel systems given the fact that the ethanol portion can absorb water when exposed, especially in humid areas near saltwater.

Introduction

Project Background:

This project was a cooperative effort to assess the feasibility for marine engines of increasing the allowable ethanol concentration in gasoline above the current legal limit of 10%. Specifically, a 15% ethanol / 85% gasoline fuel blend (E15) was tested in current production and legacy outboard marine engines. Gaseous exhaust emissions and engine durability were assessed on a typical durability test cycle. Three separate engine families were evaluated. A 200HP EFI two-stroke engine was chosen to represent legacy product. A 9.9HP carbureted four-stroke engine and a 300HP supercharged EFI four-stroke engine represented current product. Two engines were tested from each family. One was operated on E15 fuel and the other was operated on E0 gasoline. Emissions data from each engine were obtained before, in the middle of, and after durability testing.

Summary of Marine Engine Considerations:

Marine engines require unique considerations when altering the fuel supplied to operate the engine. Considering these engines are frequently used in remote locations (offshore fishing for example), it is critical to ensure that the fuel does not cause or contribute to an engine malfunction. Changes in fuel formulations and the resulting effects on marine engine operability are of high importance.

Outboard marine engines span a large range of rated power output and technology which yields significant complexity when trying to understand the effects of changing the fuel supplied to the engine. When all of the typical Mercury production engines and the Mercury Racing products are included (inboards and outboards), engines from 86cc, 2.5HP up to 9.1L 1350HP twin turbo configurations are produced. Mercury outboards (the focus of this study) range in output and design from the 2.5HP splash lubricated carbureted four-stroke engines to 350HP supercharged EFI four-stroke and 300HP direct fuel injected two-stroke engines. If sterndrive/inboard engines are considered, the technology list gets even broader. The non-racing sterndrive products range from 135HP carbureted 4 stroke to 430HP closed-loop catalyzed EFI 4 stroke with onboard diagnostics. The sales volumes of marine engines may be much smaller than automotive or small offroad utility engines, but the range of power (nearly 3 orders of magnitude) and the range of available technology of marine engines is much wider than these other categories individually.

The marine application requires an engine that has high power density and remains durable at high speeds and loads. It is important to minimize the amount of weight added to the vessel from the powertrain to maximize the payload and minimize drag. Boat hull drag is considerable at typical boat operating speeds resulting in high engine speeds and loads for extended periods. The result of these factors leads to engines which are high performance and made from premium materials. Changing the fuel specification must be carefully considered to assure that durability is not sacrificed. Figure 1 illustrates the power density of the Verado engine (the 300HP supercharged EFI engine family used in this study) compared to automotive engines that were contemporary when the Verado engine was introduced for the 2005 model year. Figure 2 shows a relative comparison of the vehicle load curves of a boat with a planing hull to an automobile. The likelihood of experiencing problems as a result of extended operation at or near WOT are far more pronounced on a marine engine than an automotive engine due to the great difference in vehicle load curves.

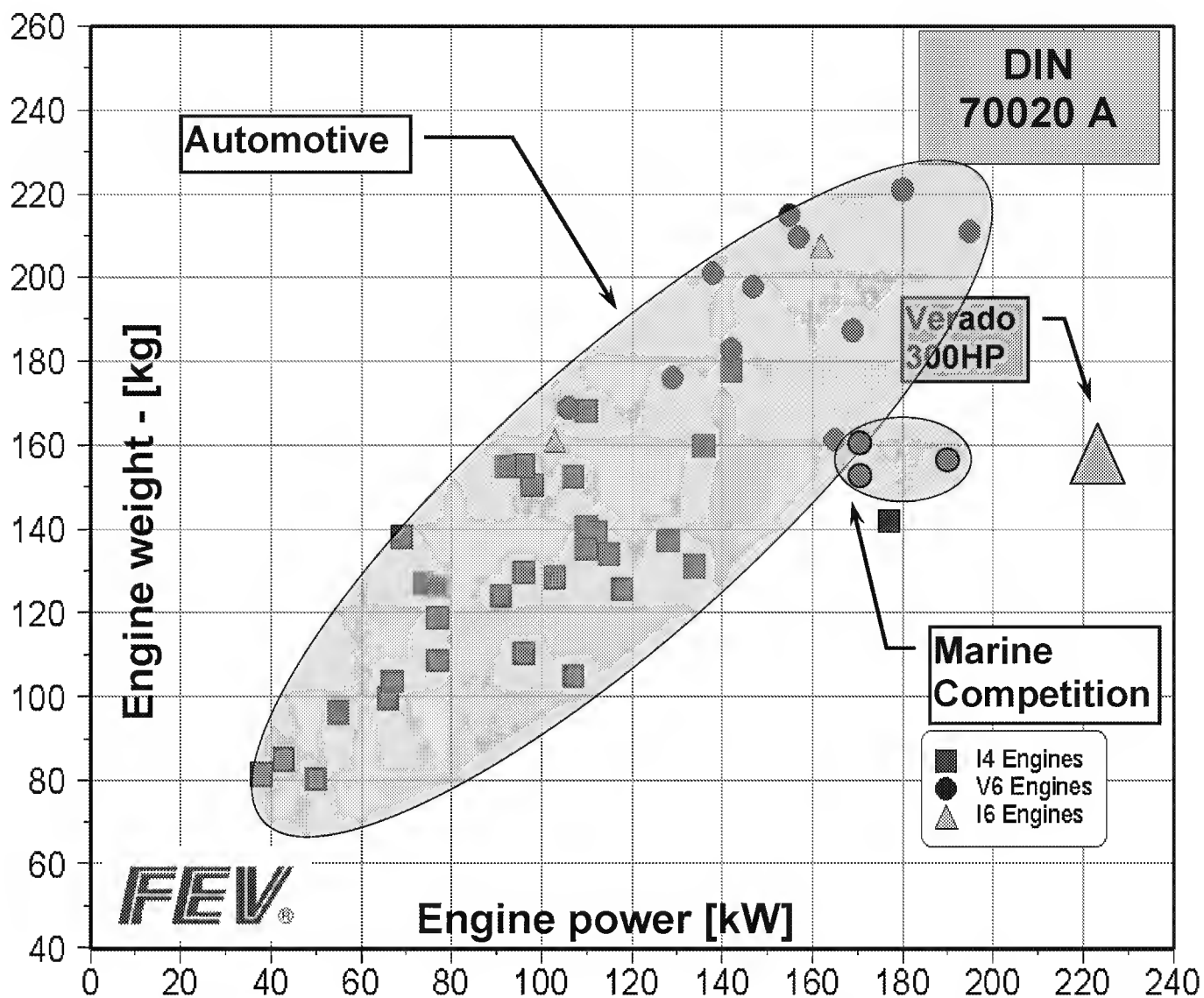


Figure 1: Power to Weight Comparison, Scatter Band Data Provided by FEV (FEV Motorentechnik GmbH)¹

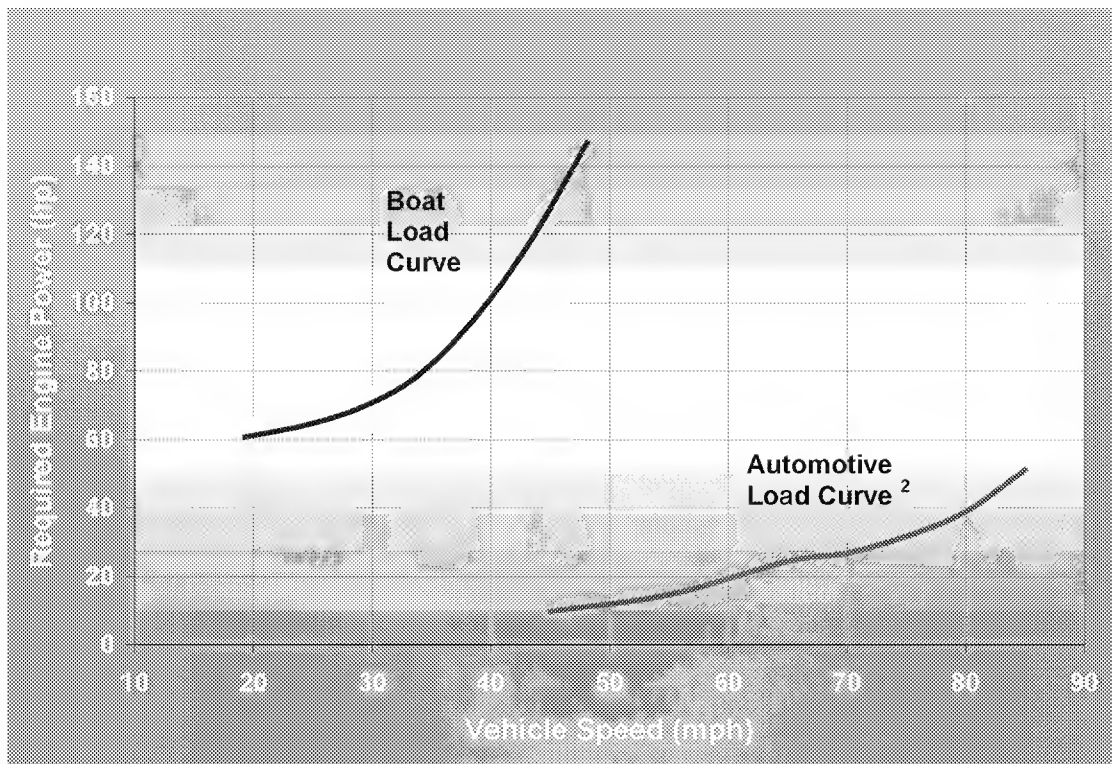


Figure 2: Example Load Curve Comparison (Automotive data – source 2, boat load data – internal Mercury source)

Investigation Details

Statement of Problem:

Procedure:

The engine testing process began by preparing each engine. This included instrumentation of the test engines as well as performing some basic checks (varied by engine type). The instrumentation process included installation of an exhaust emissions probe that met the requirements of the EPA 40 CFR Part 91 regulations.

Each engine was rigged onto an appropriate dynamometer and a break-in process was performed. The break-in consisted of increasing speed and load settings for approximately 2.5 hours total duration and was performed on E0 gasoline for all engines. This was followed by a power run to determine the wide open throttle (WOT) performance of each engine. The power run was performed on E0 gasoline on all engines and also on E15 fuel for only the E15 test engines. The power run included speed points from 2000RPM up to the maximum rated speed of the engine.

Once the WOT performance was checked, emissions testing was performed using reference-grade E0 gasoline (EEE fuel: EPA Tier II emissions reference grade fuel). The emissions tests were done in triplicate to check repeatability and were run in accordance with the EPA requirements set forth in 40 CFR Part 91. Emissions tests were also performed on the E15 engines in triplicate using the E15 test fuel. Although this E15 test fuel was not blended from the reference-grade E0 gasoline, these tests provide some comparison of exhaust emissions between E0 and E15 while minimizing engine-to-engine variability.

Following the above emissions checks, each engine was prepared for the durability testing. This included doing a basic visual inspection as well as some general engine power cylinder integrity checks (example: compression test and cylinder leak-down). These integrity checks were also repeated at the durability mid-point and end-of-life test point as well.

The first half of the durability test was then performed. Each engine was rigged in Mercury's Indoor Test Center, which consisted of large endurance test tanks, air supply systems, and data acquisition systems. Each engine was fitted with the appropriate propeller to operate the engine approximately in the midpoint of the rated speed range at wide open

throttle. The engine instrumentation was continuously monitored and the data was recorded for the duration of the endurance test. Operational shutdown limits were placed on critical channels (min/max engine speed, max coolant temperature, etc) to monitor the health of the engine for the entire durability test period. Periodic maintenance was performed on each engine (as appropriate for the engine type: oil level checks and changes, accessory drive belts, etc). This maintenance was performed in an accelerated manner as compared with typical customer maintenance intervals since the durability testing causes accelerated wear as compared with typical customer use. These protocols are typical of those used by Mercury for any durability test.

Once the first half of the durability testing was completed, each engine was rigged on the dynamometer again. Emissions tests on the appropriate fuel(s) were performed according to the procedures described above. The tests were again performed in triplicate to be able to evaluate repeatability. Each engine also got a visual inspection and the general engine power cylinder integrity checks before being returned to durability testing.

After the midpoint emissions testing was completed, each engine was returned to the Indoor Test Center endurance tank to complete the second half of the durability testing. The testing was performed in the same manner as the first half of the durability portion.

When the durability testing was complete, each engine was returned to the dynamometer for post-durability emissions tests on the appropriate fuel(s). A post-endurance WOT performance power run was also performed to compare with the pre-durability power run.

Finally, after all running-engine tests were completed, each test engine underwent a complete tear-down/disassembly and inspection. This inspection included checks and measurements to assess the degree of wear, corrosion issues, cracks, etc. on power cylinder components. Emphasis was placed on components that would be at risk due to the differences in the fuels (exhaust valves due to exhaust gas temperature differences, for example).

Test Engine Description:

The engines used for this testing were all built as new engines on the production line and were randomly selected. They were not specially built or hand-picked. The choice of engine families to include in this program was based on representing a wide range of technology, a wide range of power output, and a significant annual production volume. The final engine family selection was approved by the Technical Monitor at NREL. Two 4-stroke engine families were selected to represent current production engines. A two-stroke engine family was selected to represent "legacy" products. Table 1 summarizes each test engine configuration.

The 9.9HP four-stroke engine is used on a wide range of applications from small fishing boats, inflatable boats, and as a "kicker" engine. A "kicker" engine is an auxiliary engine used for low speed boat maneuvering while fishing on a large boat which includes a larger engine (150+HP) for the main propulsion. The 9.9HP engine is considered a portable engine. It was selected for this testing due to high sales volume and the fact that it represents the typical architecture for many of Mercury's small carbureted four-stroke offerings. It should be noted that the settings for the carburetors on both of the 9.9HP test engines were set and sealed at the carburetor manufacturer. They were not tampered with by any Mercury personnel and were run just as they would if they were used by the end customer. The only adjustment allowed was the idle throttle stop to set the idle speed, which is the only adjustment a customer has access to.

The Verado engine is considered the "flagship" outboard product at Mercury Marine. The non-Racing version used in this study is available in power outputs ranging from 200-300HP. These engines are used on boats with single, dual, triple, and even quad engine installations ranging from multi-engine offshore fishing boats & US Coast Guard patrol boats, high speed bass boats, all the way to commercial fishing vessels and ferry boats. The supercharged 300HP Verado was selected for testing due to the high performance nature of its design and the demands of this market segment. The Verado engines had an open loop electronic fuel injection system with no user adjustment possible.

The 200HP EFI two-stroke engine represents the "legacy" two-stroke products. The 2.5L platform has been the basis for carbureted, crankcase fuel injected (which is the case for the test engines used), and direct cylinder injection models. The platform has roots that can be traced back to the 1970's. This engine was selected for testing because of the large number of engines that have been built off of this platform over the last several decades and that it represents the typical architecture for a variety of Mercury's two-stroke product. An engine configuration with an EFI fuel system was selected to improve consistency in testing. The 2.5L 200HP EFI engine had an open loop electronic fuel injection system with no user adjustment possible.

Table 1: Test Engine Specifications

Engine Family	9.9HP Four-Stroke	Verado	200HP EFI
Gas Exchange Process	Four-Stroke	Four-Stroke	Two-Stroke
Power Rating at Prop	9.9HP	300HP	200HP
Cylinder Configuration	Inline 2 Cylinder	Inline 6 Cylinder	60 Degree V-6 Cylinder
Displacement	0.209 Liter	2.59 Liter	2.51 Liter
Fuel Induction System	Single Carburetor w/Accelerator Circuit, 2 Valve per Cylinder, Single Overhead Cam	Supercharged Electronic Fuel Injected 4 Valve per Cylinder, Dual Overhead Cam, Electronic Boost Control, Electronic Knock Abatement Strategy	Electronic Fuel Injected with Oil Injection, Loop Scavenged Porting, Crankcase Reed Induction, Electronic Knock Abatement Strategy
Dry Weight	108 lbs / 49 kg	635 lbs / 288 kg	425 lbs / 193 kg
Fuel Octane Requirement	87 Octane R+M/2 Minimum Required	92 Octane R+M/2 Recommended, 87 Octane R+M/2 Minimum Required	87 Octane R+M/2 Minimum Required

Test Fuel Description:

The fuels used in the endurance testing were intended to be representative of typical pump-grade fuels that could be commonly available to the general consumer. The primary factors in sourcing the E15 test fuel were consistency of fuel properties for the duration of testing, consistency of ethanol content at 15%, octane performance that met specific requirements for each test engine, and a representative distillation curve to match charge preparation characteristics. The E15 test fuel was splash blended by our fuel supplier in one batch to ensure consistency throughout testing. The E0 and E15 endurance fuels were sourced from different suppliers; as such there were likely differences in the additive packages (including the concentration of additives) of the fuels. Since the primary duty cycle was wide open throttle endurance, the additive package differences likely had little influence on the test. Since the Verado engine had a premium fuel recommendation, the E15 fuel was blended at a target of 91 octane [R+M]/2. The blend stock used was a typical pump-grade fuel that the supplier used for retail distribution. The E0 fuels used for the endurance testing were also typical pump-grade fuels that the fuel supplier had available for distribution. Both a Regular (87 octane [R+M]/2) and a Premium (91 octane [R+M]/2) fuel supply were maintained at Mercury for testing on this program and all other internal Mercury test programs. The emissions tests on E0 fuel were all performed using EPA Tier II EEE fuel sourced from specialty fuel manufacturer Johann Haltermann Ltd.

Samples of several of the test fuels were sent to outside laboratories for analysis. The parameters that were considered were: the distillation curve (ASTM D86)³, Research and Motor Octane (ASTM D2699⁴ and D2700⁵), density, and API gravity. In addition, NREL measured ethanol content via the Grabner IROX 2000 Gasoline Analyzer and ASTM D5501⁶ for the E15 fuel. The Grabner IROX 2000 measures ethanol via infrared spectroscopy (per ASTM 5845⁷) and is valid in the range of 0 – 25% ethanol. The ASTM 5501⁶ method uses gas chromatography and is only valid for high levels of ethanol (93% to 97% ethanol); it was used here only as a reference. In-house fuel samples were also taken and analyzed on the Petrospec GS-1000 analyzer. This analyzer was used to estimate the octane and measure the oxygenate concentration. Like NREL's Grabner IROX 2000, the Petrospec GS-1000 operates on the infrared spectroscopy concept and determines the ethanol concentration (up to 15%) per ASTM D5845⁷. The results from the Petrospec machine were used as reference values only, primarily for quality control.

Table 2 shows the various measurements made on the test fuels from the different measurement laboratories. The majority of the parameters were within expected ranges for the tolerance of the measurements used. The ASTM D5501⁶ procedure used at NREL showed that the ethanol concentration was 18%. The results from the 2 infrared

spectroscopy measurements from both NREL and Mercury showed concentrations of approximately 14%. The results from the 2 methods bracket the target concentration of 15%, which was the actual concentration that the fuel was blended to at the fuel supplier. Only one sample of E15 was analyzed, which was valid since all of the E15 fuel was blended in one batch. The data sets from the 87 octane bulk/pump fuel and the 91 octane bulk/pump fuel used on endurance, and the data from the EEE were from one load of fuel of the multiple loads of fuel of each type used during the duration of the testing.

Table 2: Fuel Analysis Results

Fuel Analysis		E15 Fuel	EEE	87 Bulk Fuel	91 Bulk Fuel	91 Bulk Fuel Repeat
Sample Date		10/21/2010	10/8/2010	10/15/2010	10/15/2010	2/10/2011
Fuel Analysis Performed at Outside Laboratory						
Research Octane (ASTM D2699)	RON	95.7	97.2	89.6		93.4
Motor Octane (ASTM D2700)	MON	86.3	88.5	84.6		87.5
[R+M]/2	AKI	91.0	92.9	87.1		90.45
Density @ 15.5C	kg/L	0.752	0.744			
API Gravity	°API	56.5	58.7			
Fuel Analysis Performed at NREL						
Ethanol Content (ASTM D5501)	%	18+/-1%				
Ethanol Content (IROX analyzer)	%	14%				
Fuel Analysis Performed at Mercury Marine						
Petrospec analyzer (E15 data ave. of 2 samples)						
Ethanol Content	%	14.1%	0	0	0	
RON	RON	95.7	95.8	89.4	92.9	
MON	MON	84.7	87.7	83.3	87.2	
[R+M]/2	AKI	90.2	91.7	86.4	90.1	
Reid Vapor Pressure (Mercury analysis)	PSI	8.5	9.0	10.8	10.7	

The distillation curves for the various test fuels were also measured. The results can be seen in Figure 3 below. The data shown in Figure 3 were from the actual test fuels used in this testing. The distillation curve from the E15 fuel showed a large step change in the region of the boiling point of ethanol, as was expected.

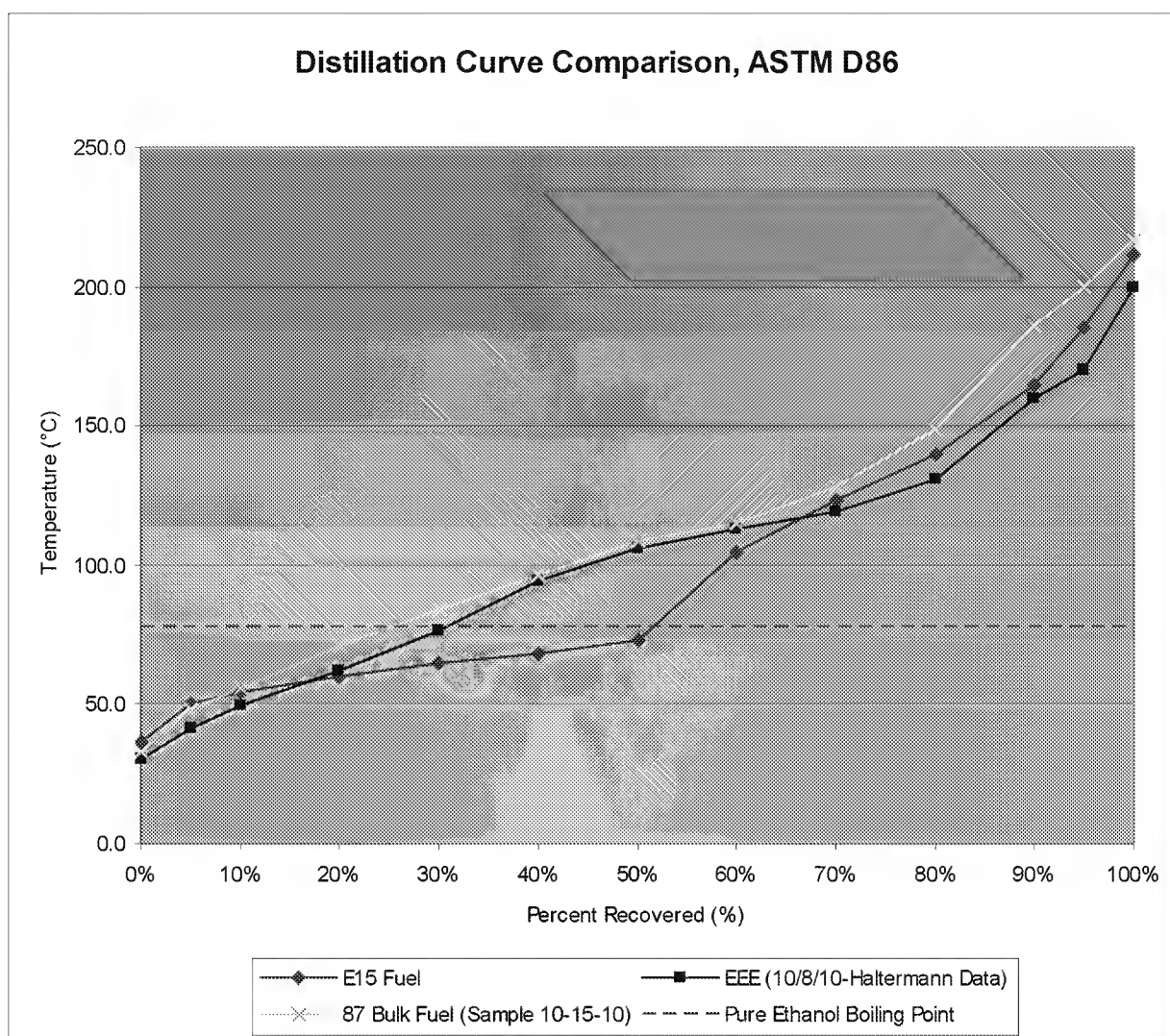


Figure 3: Distillation Curves of Test Fuels

Engine Testing Results

9.9HP Four-Stroke:

Endurance Test Results

The endurance testing on the 9.9HP engine family precipitated no significant failures. There were no incidents related to the test fuels reported on either engine. There were several parameters measured at the start, middle, and end of test to check the general health of the engine during the course of the endurance test. These included cranking compression, power cylinder leakdown, cam timing, and valve lash. All of these parameters remained relatively unchanged through the course of testing within the repeatability of the measurement techniques used. Several fuel-effect differences between the test engines, however, were discovered during the end of test teardown and inspection. These differences are summarized in the section below.

Emissions Testing Results

A summary of the emissions results are shown in Figure 4 below, with the 5 mode total weighted specific HC+NO_x values plotted on the Y axis and the amount of endurance time on each engine plotted on the X axis. Each data point on the curve represents the average emissions value of the 3 emissions tests performed at each interval. The error bars represent the minimum and maximum values of the 3 emissions tests at each interval. The dashed yellow line shows

the data from the E0 engine (serial number 0R364814). The solid red and blue lines show the emissions data from the E15 engine (serial number 0R352904) using E15 and E0 (EEE) fuels, respectively. Figure 4 shows that the E0 engine had significantly lower emissions than the E15 engine when run on the same fuel. After reviewing the history of the emissions audits on this engine family dating back to its introduction in 2005, both of these engines were within normal production variability.

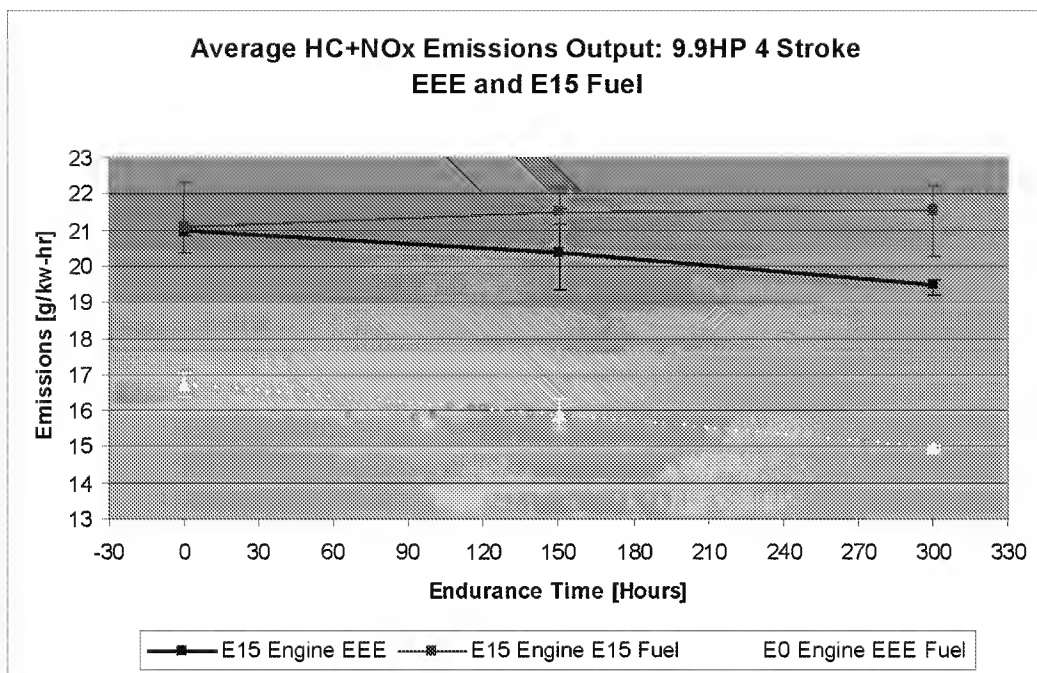


Figure 4: 9.9HP Four-Stroke HC+NOx Emissions Results Summary

In order to better understand the emissions output, the HC, NOx, and CO constituents were broken out and plotted separately in Figures 5, 6, and 7 respectively. The values for each constituent are the five mode totals of each.

Figures 5 and 6 show that the HC emissions predominantly defined the overall trends and variability in the total HC+NOx trends seen in Figure 4. The NOx data shown in Figure 6 had low test-to-test variability and the values were relatively flat (perhaps slightly declining for the E15 engine on E15 fuel) over the life of both engines.

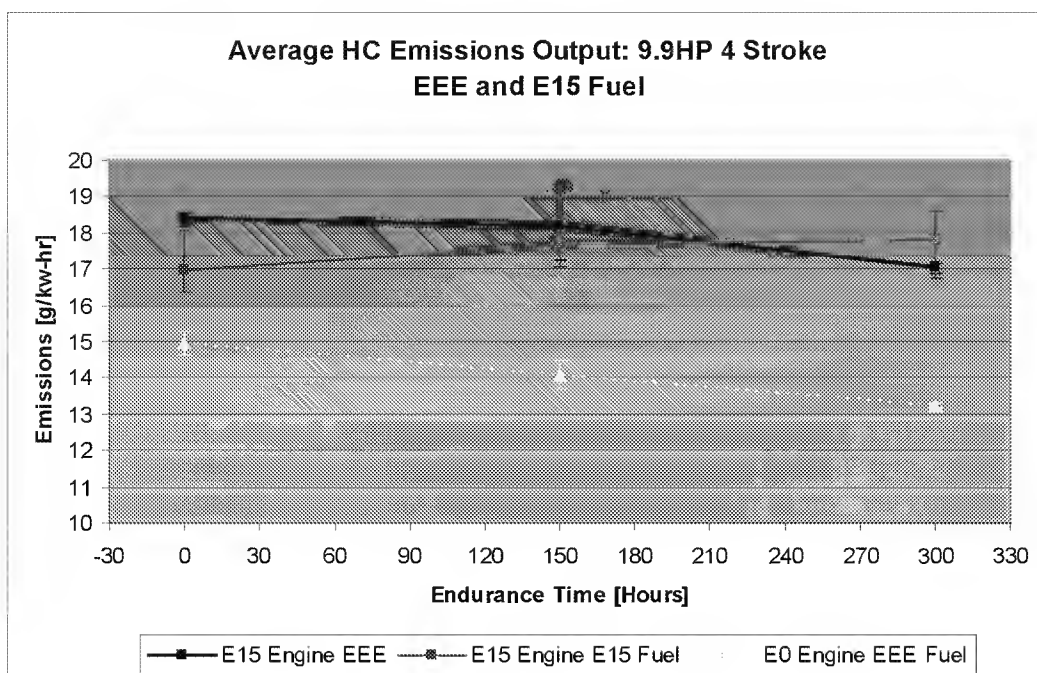


Figure 5: 9.9HP Four-Stroke HC Emissions Results Summary

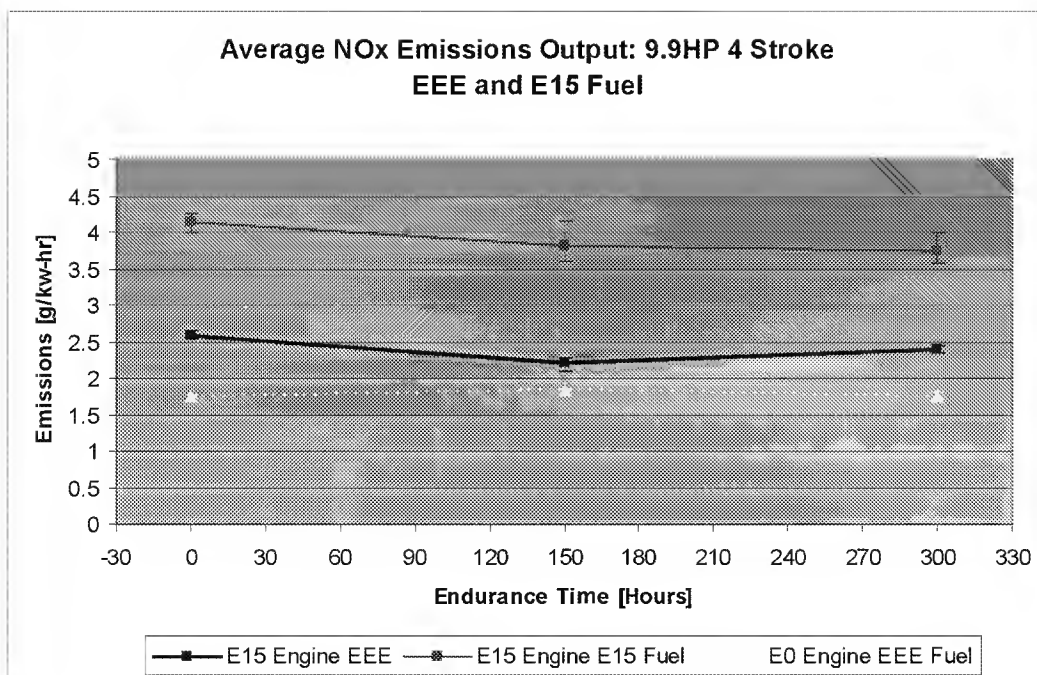


Figure 6: 9.9HP Four-Stroke NOx Emissions Results Summary

There was a general downward trend in CO over endurance time for the E15 engine on both fuels. The E0 showed some reduction in CO between 0 and 150 hours and remained relatively flat from 150 to 300 hours. The reduction in CO would suggest that the engines were running leaner since the primary driver for changing the CO emissions is typically the equivalence ratio.

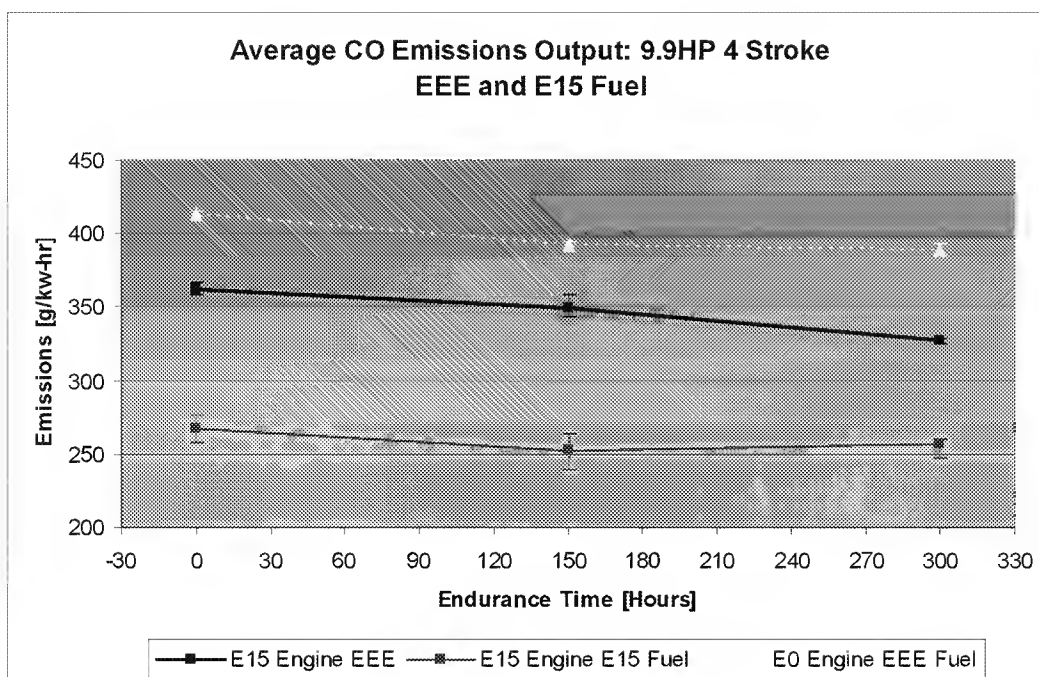
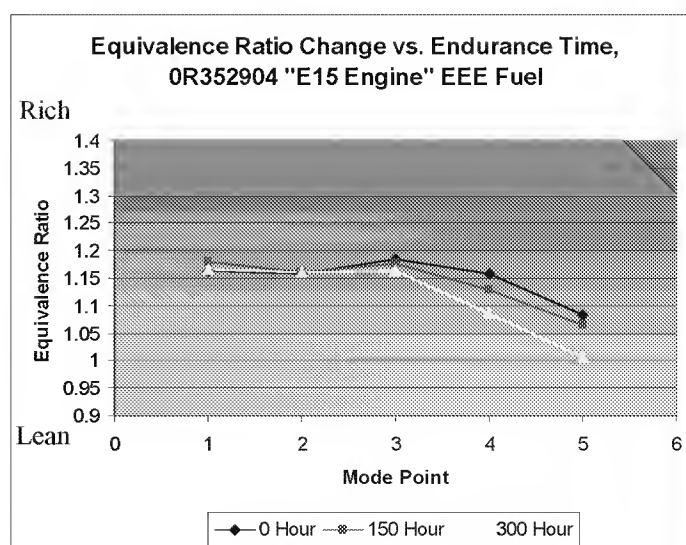
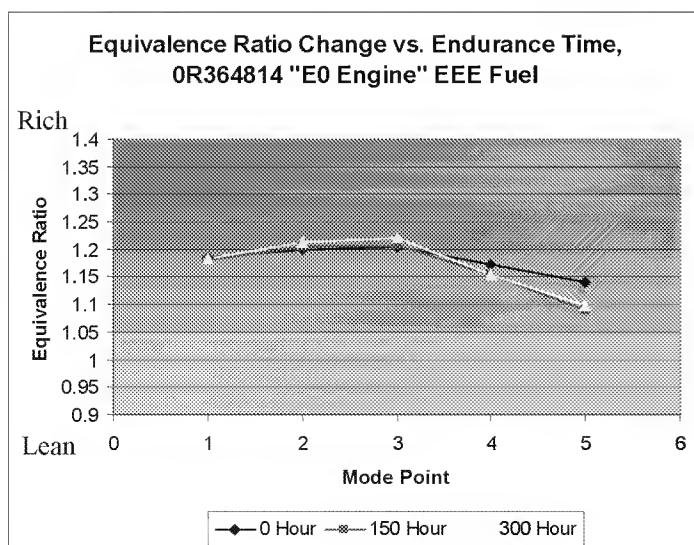


Figure 7: 9.9HP Four-Stroke CO Emissions Results Summary

The enleanment over time trend predicted from the CO data in Figure 7 was confirmed in Figures 8 and 9 for both the E0 and E15 engines operated on EEE-E0 fuel in both cases. The interesting thing to note was that the primary modes that became leaner were modes 4 and 5. During the end of test inspection on both engines, wear on the throttle plates was found on the sides where the throttle shafts went through the carburetor bodies. The wear caused gaps around the throttle plates which allowed excess air to enter the engines at low throttle opening positions (high manifold vacuum), which included Modes 4 and 5. The amount of wear found was considered normal for the amount of endurance time the engines experienced and was found on both engines.

It should be noted that the E15 engine ran leaner than the E0 engine when operated on EEE-E0 fuel, as can be seen in Figures 8 and 9 from a comparison of the "0 hour" equivalence ratios of both engines. This difference in equivalence ratio is considered to be in the normal production variability of this carbureted engine family.



Figures 8 & 9: Change in Equivalence Ratio vs. Endurance Time-EEE Fuel on E0 engine and E15 Engine

In addition, the equivalence ratio vs. endurance time data was plotted for the E15 engine when operated with E15 fuel in Figure 10. The graph shows the same trend of leaner operation vs. endurance time for Modes 4 and 5, as expected. However, when looking at the equivalence ratio values generated by the engine at Mode 5, it is clear that the engine ran very lean after 300 hours of endurance. This lean operation was the result of the inherent enleanment from the E15 fuel coupled with the trend of the engine to operate leaner with more endurance time due to the throttle plate wear.

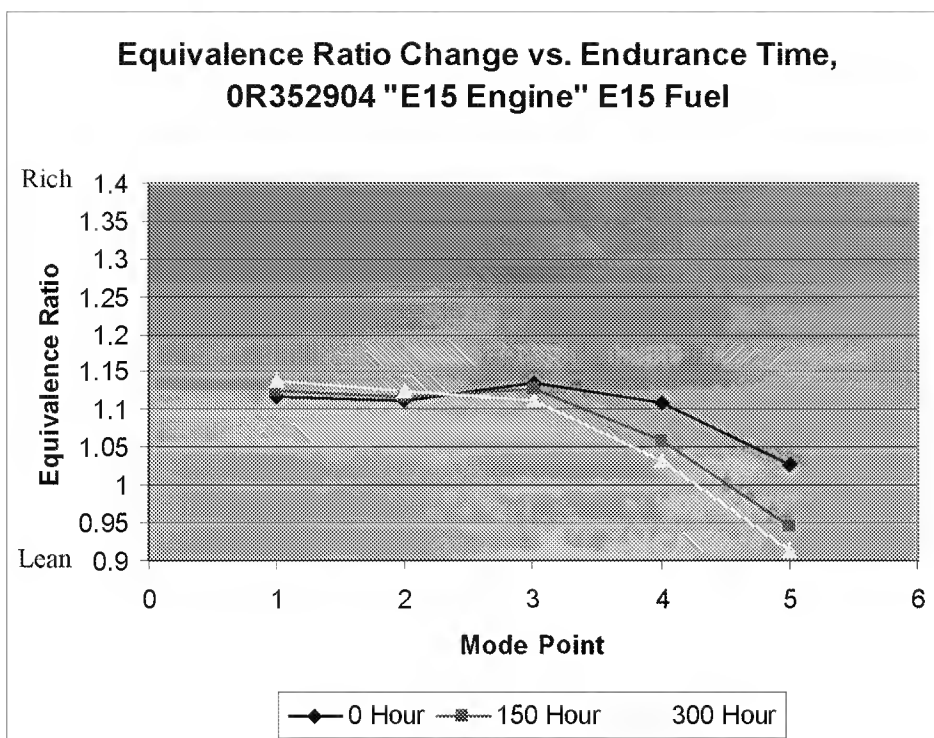
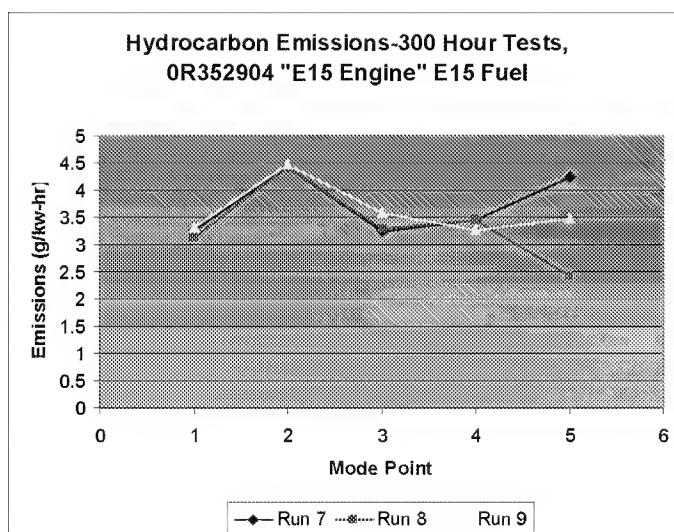
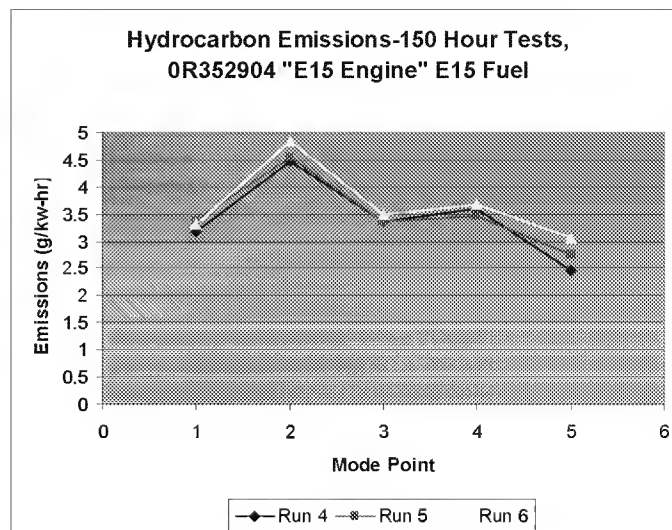
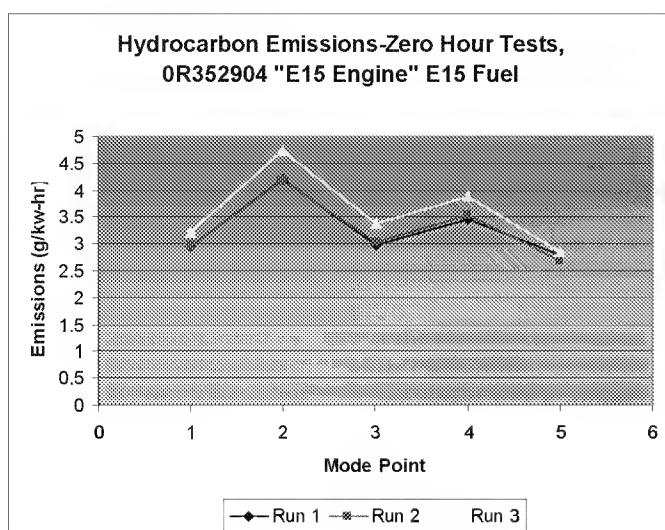


Figure 10: Change in Equivalence Ratio vs. Endurance Time-E15 Fuel on E15 Engine

It is clear that both engines ran leaner with more endurance time, yet the HC emissions increased (on average) for the E15 engine using E15 fuel (see Figure 5). To get more understanding, the hydrocarbon emissions results from each individual emissions test were plotted out in Figures 11-13 for the E15 tests at 0, 150, and 300 hours of endurance, respectively. The difference in HC at the 300 hour emissions check was caused by the Mode 5 (idle) point as Figure 13 shows. The high variability of HC emissions at Mode 5 may have been caused by poor run quality leading to intermittent misfire as the equivalence ratio trended further lean of stoichiometric (<0.925) with increasing run time.



Figures 11, 12, and 13: Hydrocarbon Emissions Outputs for Each Emissions Test, E15 Engine on E15 Fuel

Engine Performance Comparison

The power and torque data from the E0 9.9HP engine is shown in Figure 14 below. [Note: All power and torque curves were normalized to a set torque and power to make consistent comparisons possible across different engines, fuels, and amount of endurance time. The highest power and torque values generated on any of the tests were used as the reference power and torque setting and the runs were normalized back to these values.] There was a clear trend of increasing power and torque with more endurance time on the E0 engine. There was an increase of 3.2% in peak power and a 2.1% increase in peak torque when comparing the zero hour test with the 300 hour test. Similar graphs for the E15 engine are shown in Figure 15 on the E0-EEE fuel and in Figure 16 on the E15 fuel. Figures 15 and 16 show that there was generally a trend of decreasing power and/or torque with more endurance time on the E15 engine. On the E0-EEE fuel there was no change in peak power, but a loss of 1% peak torque when comparing the zero hour test with the 300 hour test on the E15 engine. Results on E15 fuel were similar, with a loss of peak power of 0.9% and a loss of peak torque of 2.1% when comparing the zero hour test with the 300 hour test. The mechanism that caused the E0 engine to have increasing power vs. endurance time and the E15 engine to have decreasing power vs. endurance time is unclear.

Figure 17 shows a comparison of the fuel's effect on the engine performance. The E15 fuel power run shows more torque generation throughout the speed range tested. There is approximately 1.75% more torque (and therefore, more power) on average throughout the speed range. Due to the enleanment from the fuel change, the engine may have been operating in a range closer to the Lean Best Torque on the E15 fuel and/or the volumetric efficiency may have been improved due to the additional charge cooling afforded by the heat of vaporization difference of the fuels. Figure 18 shows the difference in exhaust gas temperatures during the same power runs on the 2 different fuels. There was an approximately 17°C increase in EGT on both cylinders due to the enleanment from the E15 fuel.

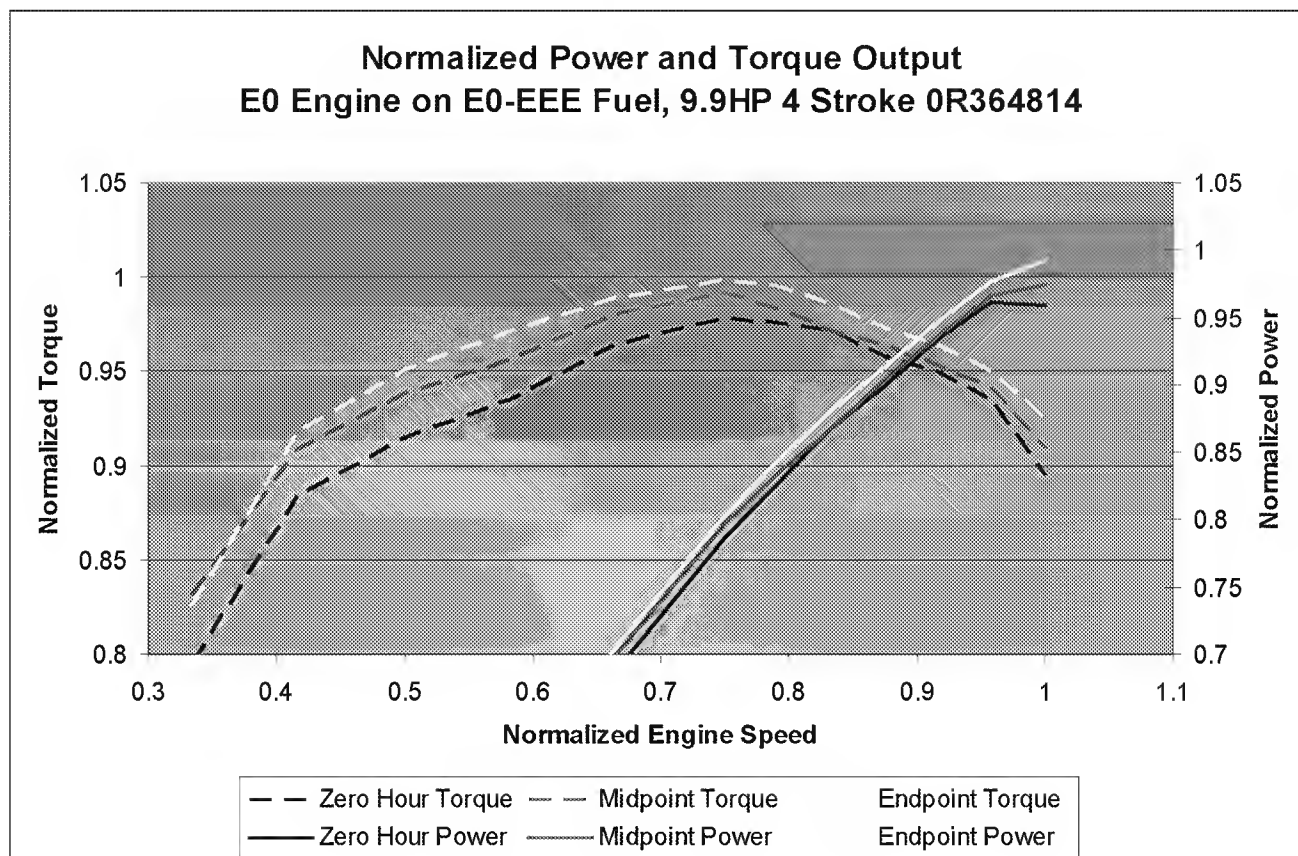


Figure 14: E0 Engine Power and Torque Output at Endurance Check Intervals

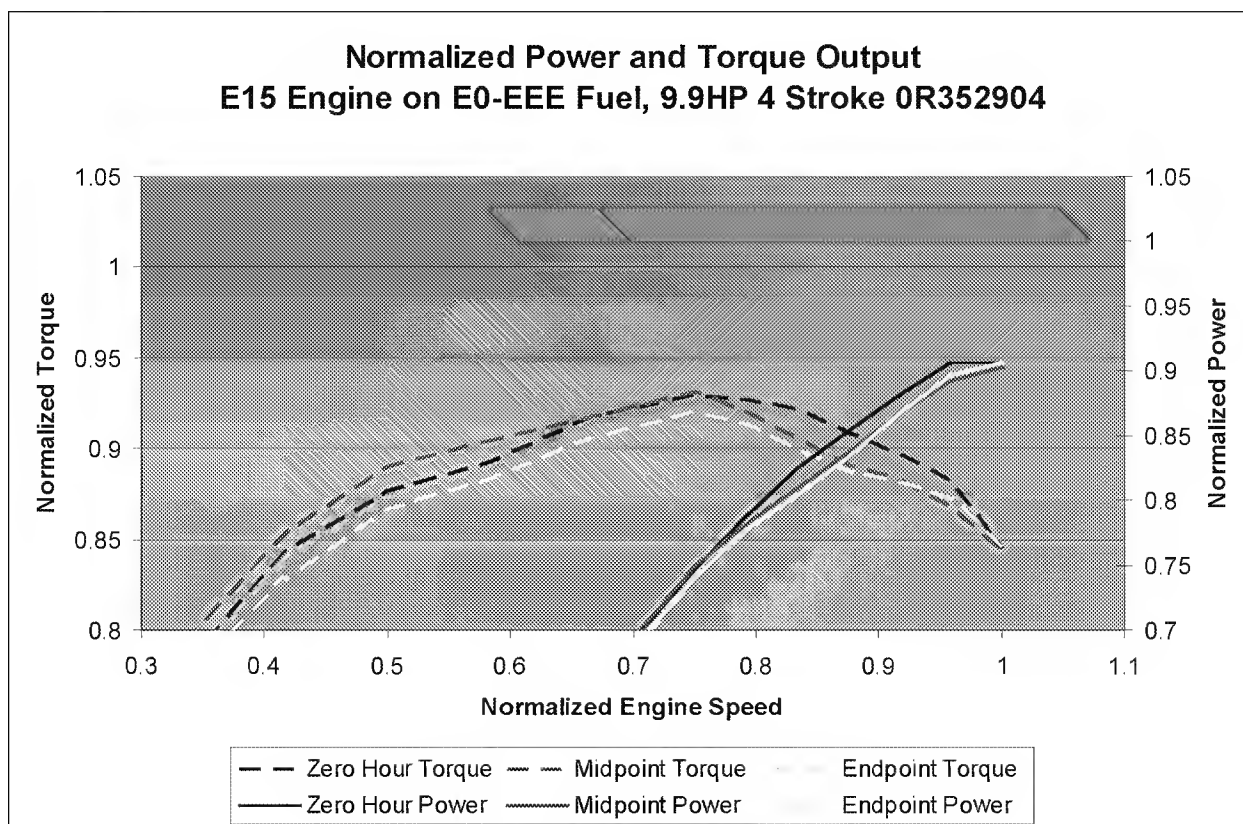


Figure 15: E15 Engine Power and Torque Output at Endurance Check Intervals-EEE-E0 Fuel

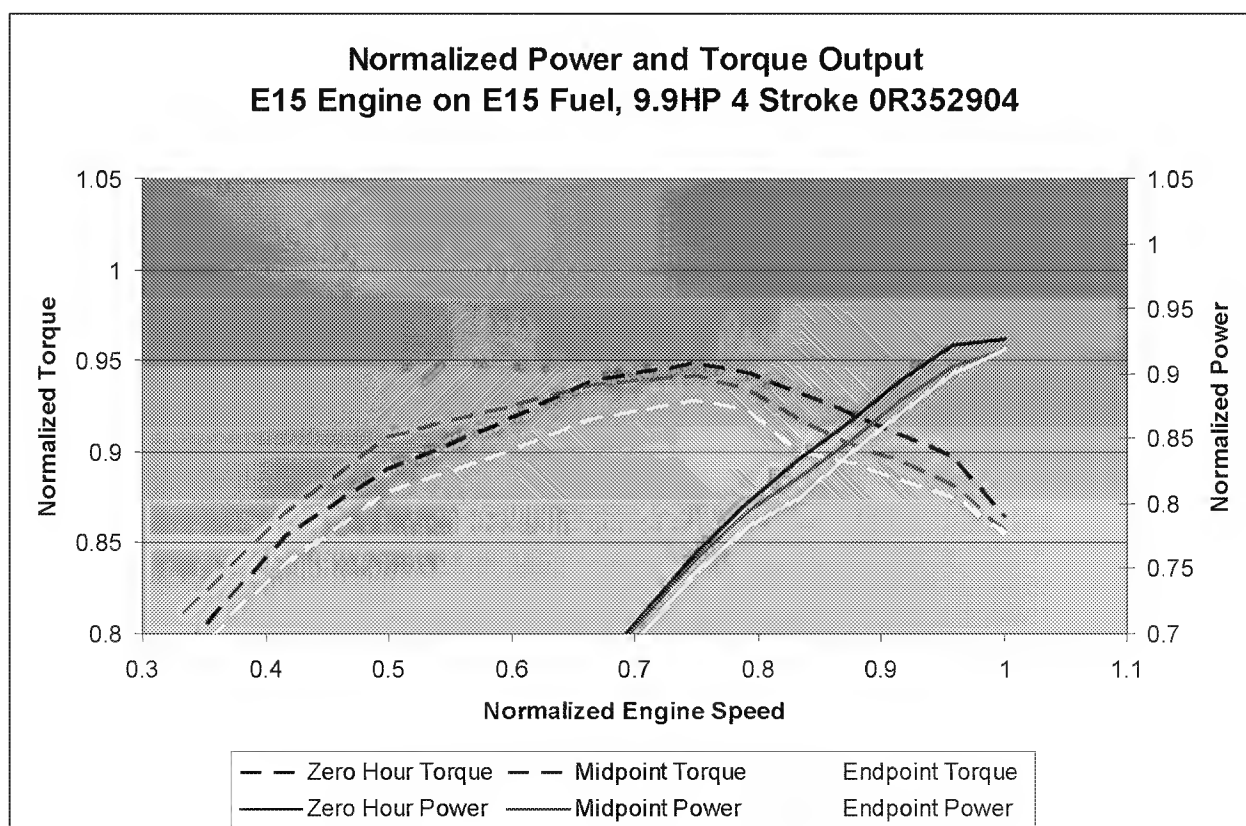


Figure 16: E15 Engine Power and Torque Output at Endurance Check Intervals-E15 Fuel

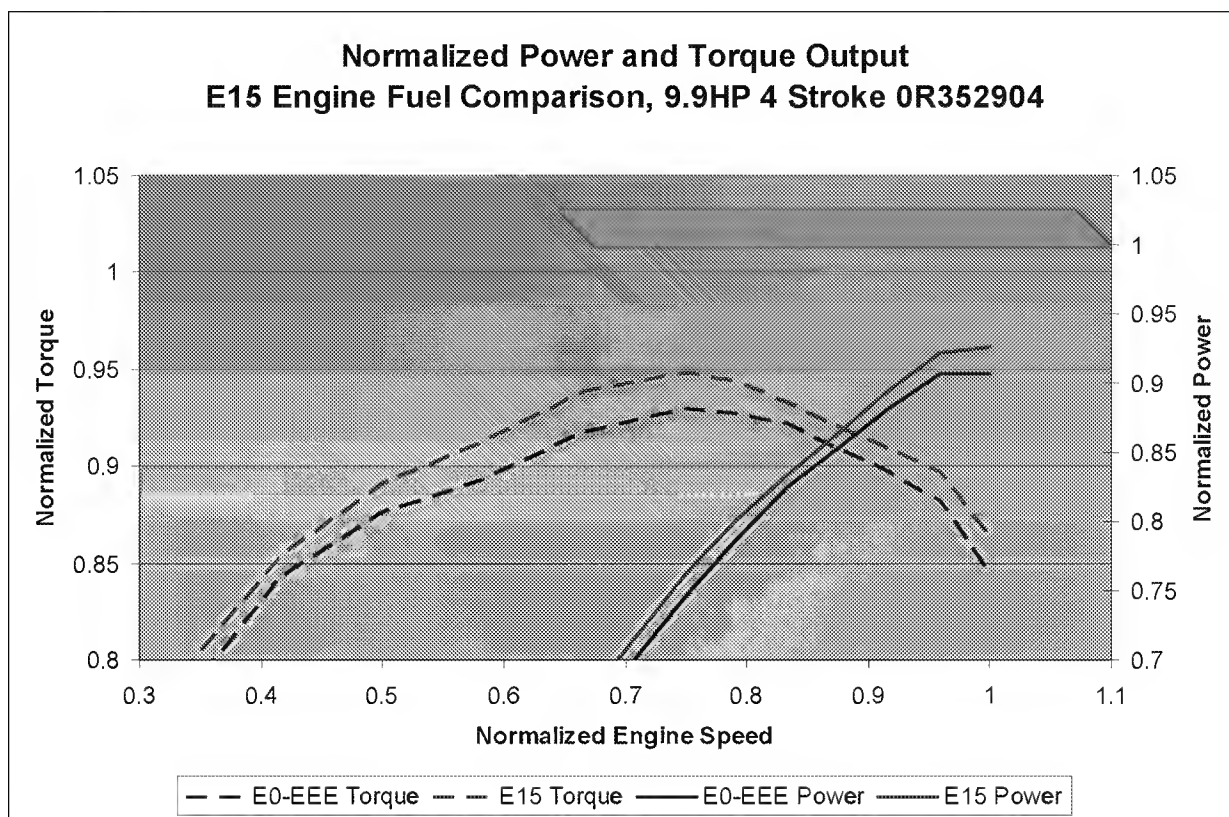


Figure 17: E15 Engine Power and Torque Output, Zero Hour Check-E0-EEE Fuel vs. E15 Fuel

Exhaust Gas Temperature Comparison
0R352904 E15 Engine, Various Fuels
Zero Hour WOT Power Run

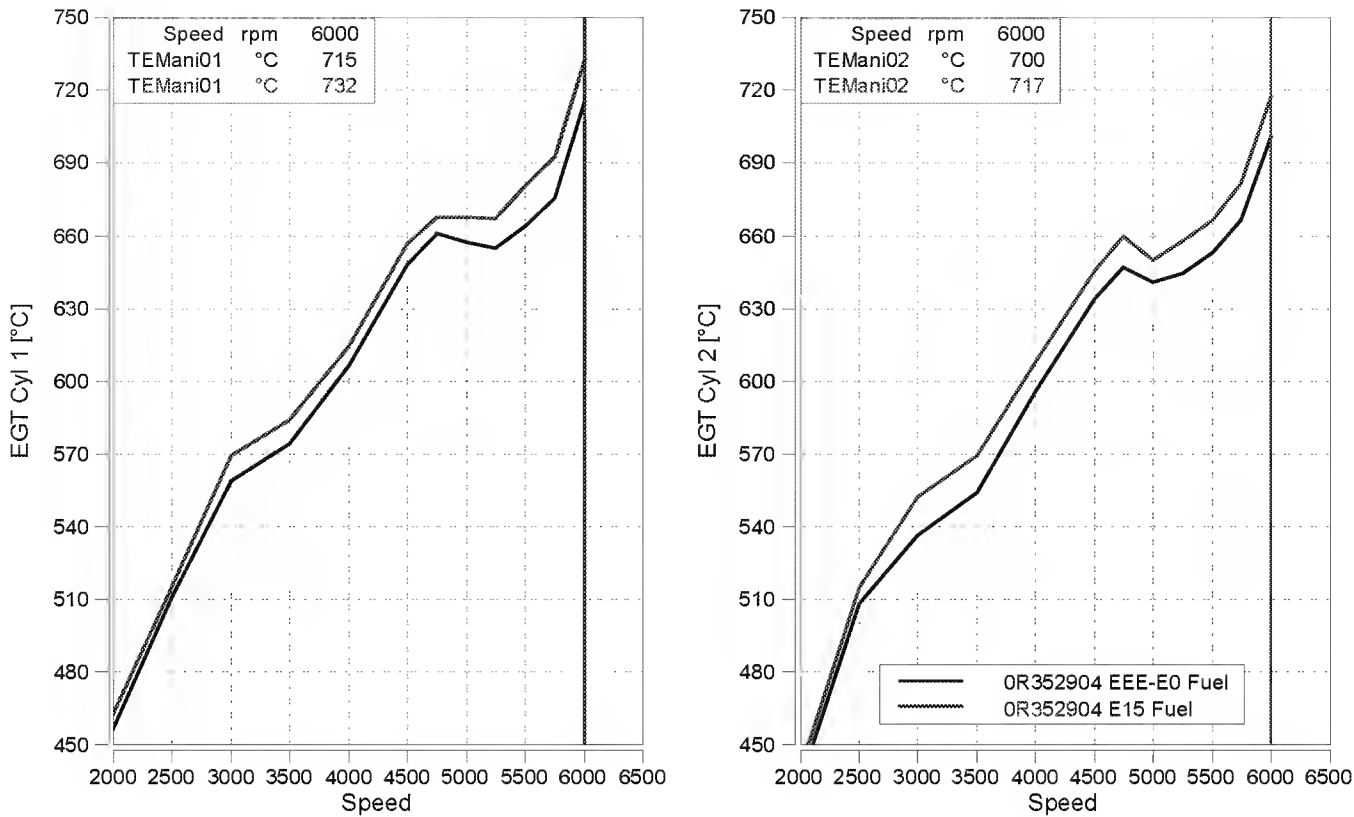


Figure 18: E15 Engine-Exhaust Gas Temperature Comparison, Zero Hour Check-E0-EEE Fuel vs. E15 Fuel

End of Test Teardown and Inspection

When the running engine testing was completed, the engines were disassembled and inspected. The main areas of focus were looking for signs of wear or deterioration and also material compatibility issues.

Upon initial inspection, there were indications that some of the main engine components on the E15 engine were subjected to higher operating temperatures. There were more carbon deposits observed on the undercrown area of the pistons and the small end of the connecting rod, suggesting that the pistons were operating at a higher temperature. Comparisons of the pistons and rods can be seen in Figures 19 and 20, respectively.

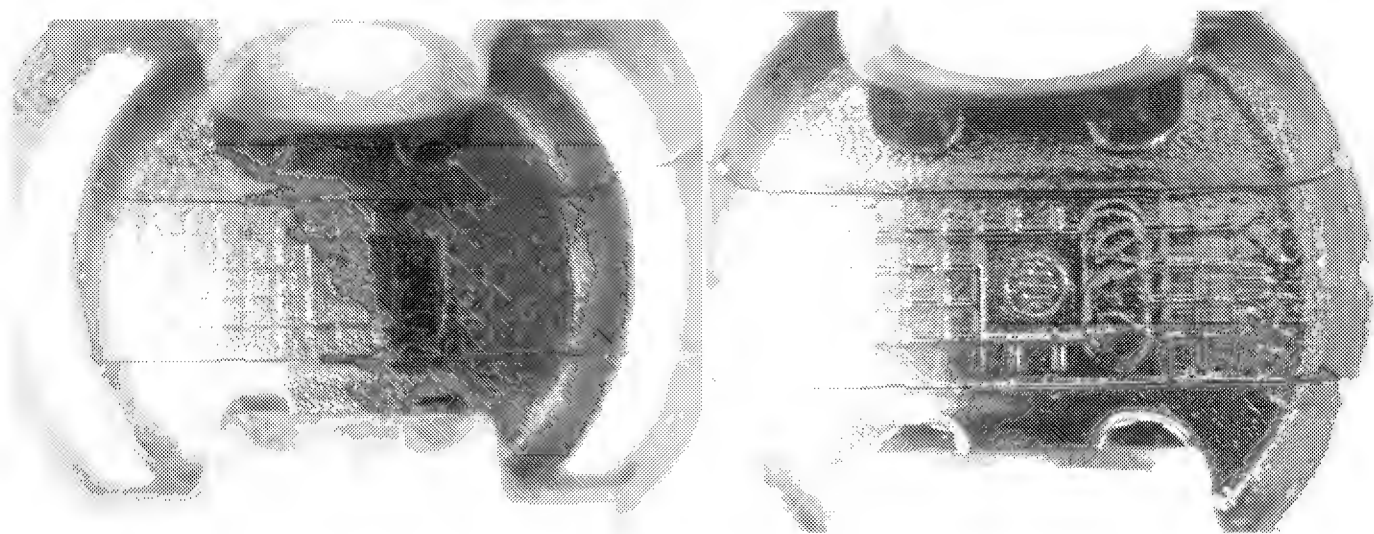


Figure 19: Piston Undercrown Carbon Deposit Comparison, Cylinder 1, E0 on Left, E15 on Right

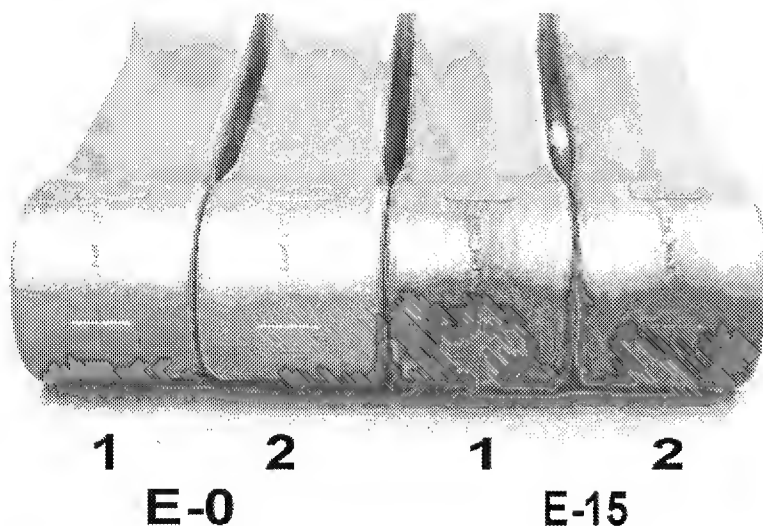


Figure 20: Small End of Connecting Rod Carbon Deposit Comparison, E0 on Left, E15 on Right

Although there were no indications of fuel pump failure during engine test, the mechanical fuel pumps were also disassembled and inspected following testing to look for abnormal signs of wear or degradation. The check valve gasket on the E15 engine showed signs of deterioration compared with that from the E0 engine. The gasket from the E15 pump had a pronounced ridge formed in the area that “hinged” when the check valve was in operation (see notes in Figure 21). The E15 gasket material in the area that sealed the check valve also had signs of wear that were more advanced than the E0 gasket. There was a significant amount material transfer from the gasket to the plastic check valve that it sealed as shown in Figure 22. Both fuel pumps were exposed to their respective test fuels for a period of approximately 2 months. More investigation is necessary to understand the effects of long term exposure of these components. It should be noted that the fuel pump flow performance was not tested. There were no indications that there was a problem with the fuel pump before disassembly. Once the deterioration was noted during teardown, it was determined that measuring the flow performance after disassembly and subsequent reassembly would have likely introduced error in the measurement.

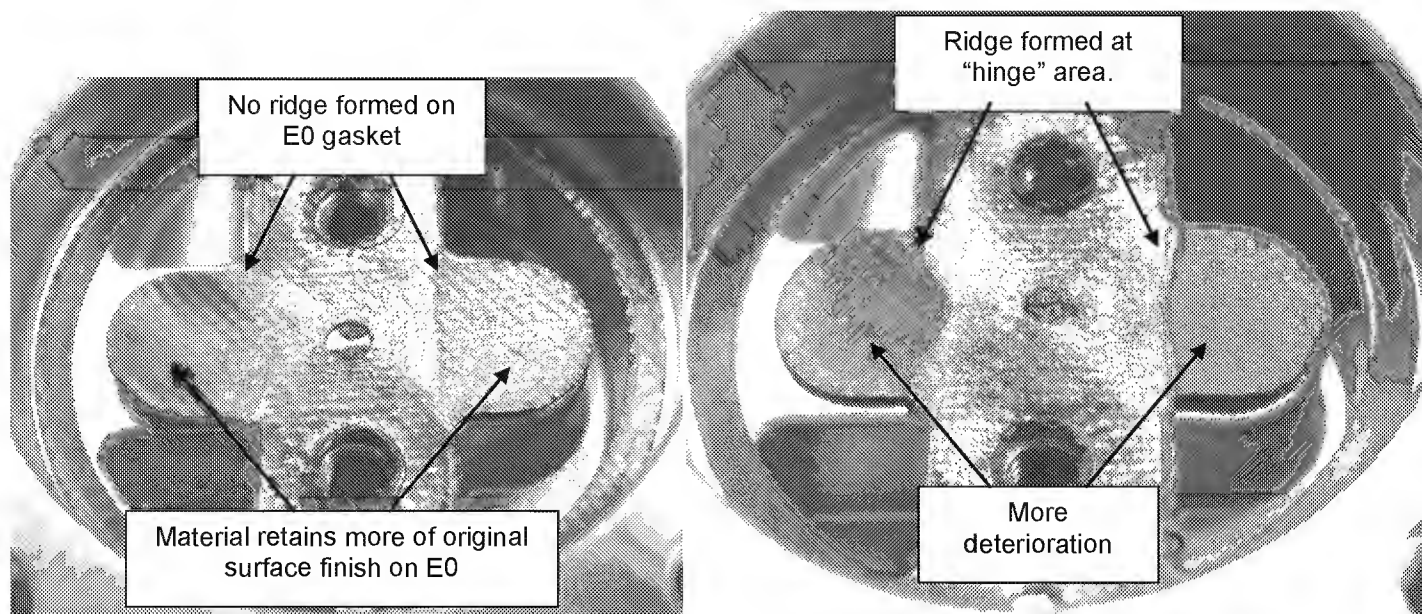


Figure 21: Fuel Pump Check Valve Gasket Comparison, E0 on Left, E15 on Right



Figure 22: Fuel Pump Check Valve Comparison, E0 on Left, E15 on Right

Due to the visible differences in some of the engines' metal components, several components were sent to the in-house metallurgy lab for further analysis. Results of this analysis are included in Table 3. The Vickers hardness test was performed using a Clemet Microhamess Tester with a conversion to the Rockwell C scale where applicable (on steel parts). The Brinell scale was used for the aluminum parts, as they are much softer than the steel parts. The values shown were the average of 3 measurements for each component with the exception of the valve bridge in the cylinder head where only 2 measurements were taken. However, due to the fact that only 1 component from each engine on the 2 fuels was tested the results have no statistical significance and should be taken as an indicator only. Also, no hardness measurements were taken on the components prior to testing so there was likely some normal part-to-part variability in hardness as the components were originally manufactured.

Taking all of these issues into consideration there were indications that some of the components had different hardness values. These differences were most likely related to the continuous operating temperatures of the components. The most notable differences were the pistons, the valve bridge in the cylinder head and the intake valve stems. The piston measured from the E15 engine had a hardness value approximately 13.2% lower than the piston from the E0 engine. This would suggest that the E15 piston experienced a higher operating temperature, as expected due to the lean

operation. The carbon deposits on the underside of the piston due to oil coking also suggest the E15 pistons were running hotter as noted previously. The intake valve stem measurements showed an approximately 12% difference in hardness, with the E0 engine having the lower values. This difference would suggest that the E0 intake valve stems were running hotter during operation than the E15. This difference was likely due to the charge-air cooling effect of ethanol in the E15 fuel resulting in cooling of the intake port and leading to lower intake valve stem temperatures. The evaporative cooling in the intake port could also explain why the valve bridge hardness measurements indicated that the valve bridge on the E15 engine had lower operating temperatures evidenced by the roughly 11% higher hardness value. The other measurements showed differences that were likely within the repeatability of the measurements and the manufacturing variability so no conclusions could be drawn from them.

The piston is generally a higher-stressed component than the intake valve. The reduction in hardness of the intake valve for the E0 engine is not likely to increase failure rates since this engine family was qualified for E0 operation as a baseline. However, if the reduction in hardness of the piston with E15 fuel was found to be a statistically significant result, E15 fuel usage might increase the failure rate of this component.

Table 3: Hardness Measurements on Various 9.9HP Four-Stroke Engine Components

9.9HP Four Stroke	Hardness Scale	E0 0R364814	E15 0R352904	Percent Difference
Piston, Cyl 1	BHN	91.0	79.0	13.2%
Connecting Rod, Small End Cyl 1	BHN	112.0	112.0	0.0%
Exhaust Valve Stem, Cyl 1	Rc	21.7	22.1	-2.0%
Exhaust Valve Head, Cyl 1	Rc	30.1	30.7	-2.0%
Valve Bridge in Cyl. Head, Cyl 1	BHN	83.0	92.0	-10.8%
Intake Valve Stem, Cyl 1	Rc	33.0	36.9	-11.9%
Intake Valve Head, Cyl 1	Rc	39.6	39.1	1.3%

Verado 300HP Supercharged Four-Stroke:

Endurance Test Results

Several engine failures occurred during endurance testing on the Verado engines, two of which were not related to the fuel and one of which may have been associated with the use of E15 fuel. The two non-fuel-related engine failures included a casting defect and a test facility induced failure. A third engine failure, involving failed exhaust valves is believed to have been caused by the E15 fuel. Failure mechanisms are described in detail below.

E0 Engine #1-Casting Defect: The first engine to fail was the E0 Verado-serial number 1B812775. At 177 hours of WOT endurance (204.2 total engine hours) the engine was shut down for a routine oil check. An excessive amount of water was found in the oil. The engine was disassembled and the major components were pressure checked. A leak path was discovered from the water jacket to the intake port on one cylinder. The cylinder head was sectioned and an oxide fold line from the casting process was discovered. This defect was present from the time of the original casting process and took thermal cycling, load, and time to cause a leak. It was in no way associated with the fuel.

E0 Engine #2-Test Facility-Induced Failure: An additional engine was obtained to replace the original E0 engine and this engine was given the serial number 1B821775A. This engine did the initial dyno tests and was put on endurance. After 88.7 hours of WOT endurance (98 total engine hours), the engine was automatically shut down by the endurance facility control system for low exhaust gas temperature. Investigation showed water entering the exhaust stream. The engine was then disassembled and a significant amount of mineral deposits were found in the cooling passages, especially in the exhaust collector on the cylinder head. See Figure 23. [Note: For a coolant fluid, outboard engines draw in water from the body of water they are operating in, which in this case was the endurance test tank.] An interaction between

the pH and hardness of the water in the test tank created conditions that precipitated out minerals (primarily calcite) when exposed to the elevated temperatures in the cooling passage, especially near the exhaust collector. The blocked passages prevented adequate cooling in the exhaust collector, which eventually failed the head gasket and allowed water to enter into the exhaust stream. See Figure 24. It should be noted that these water chemistry conditions were specifically caused by the test facility water conditioning and would not be something that the engine would experience in real-world use.

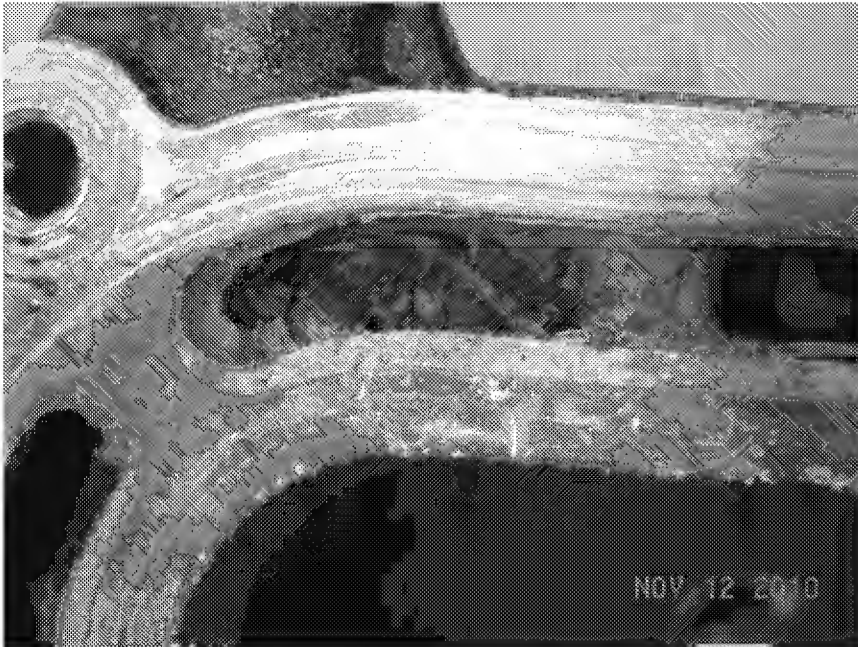


Figure 23: Mineral Deposits in Cooling Jacket, E0 Verado 1B812775A

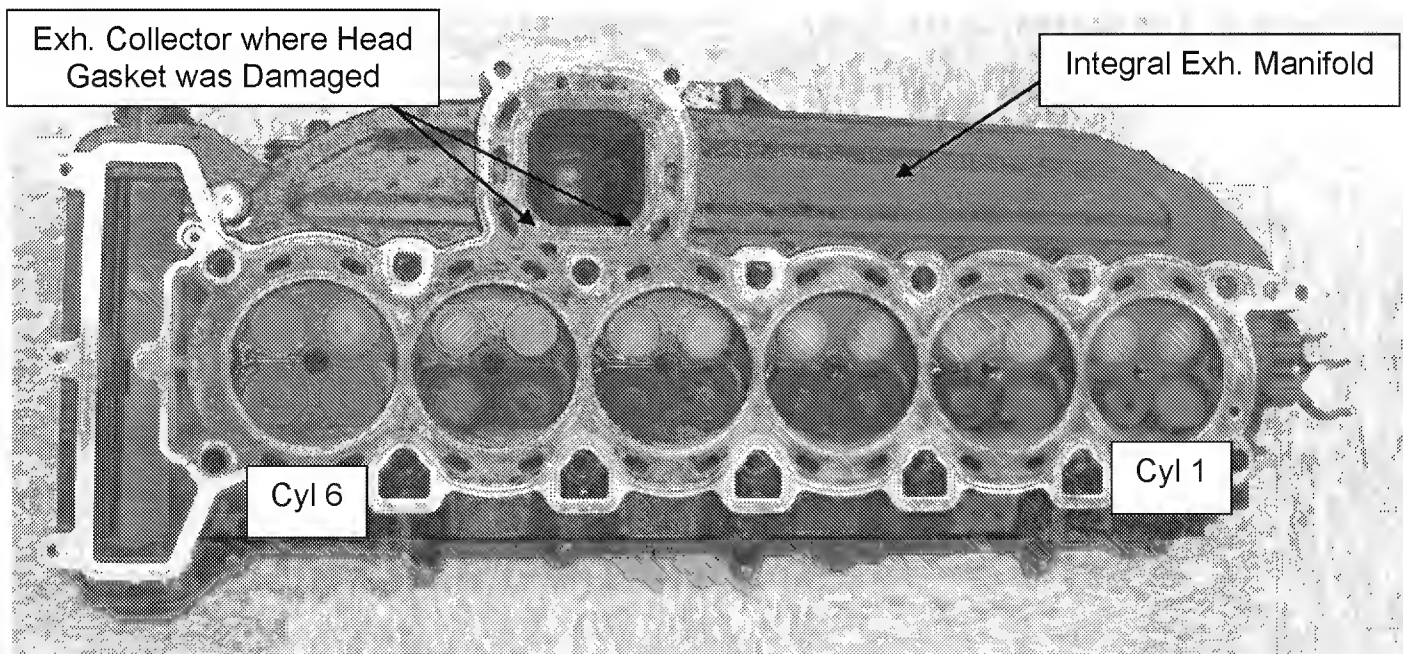


Figure 24: Verado Cylinder Head Indicating Where Head Gasket Failure Occurred, E0 Verado 1B812775A

E15 Engine: At 285 hours of endurance operation (323 total engine hours), the E15 Verado test engine (serial number 1B812776) was noted to have rough idle after restarting shortly after maintenance was performed. A compression check was performed showing no compression on cylinder 3. During disassembly a broken exhaust valve was found in cylinder #3. Further investigation found that the other exhaust valve on cylinder 3 had developed a crack, as well as one

of the exhaust valves in cylinder 6. See Figures 25 and 26. NOTE: The images shown in Figure 26 of the cracked exhaust valves had been cleaned of deposits prior to photography.



Figure 25: Broken Exhaust Valve from E15 Verado 1B812776, Top Valve in Cylinder 3



Figure 26: Cracked Valves from E15 Verado 1B812776, Bottom Valve in Cyl. 3 Left, and Top Valve in Cyl. 6 Right

The cracked valves and several valves without cracks from the E15 Verado were analyzed in Mercury's materials laboratory. The cracked valves were visually inspected with an optical stereoscope. The fatigue initiation sites were clearly identified. Figure 27 shows an example of the images of the initiation sites from the bottom exhaust valve from cylinder 3.

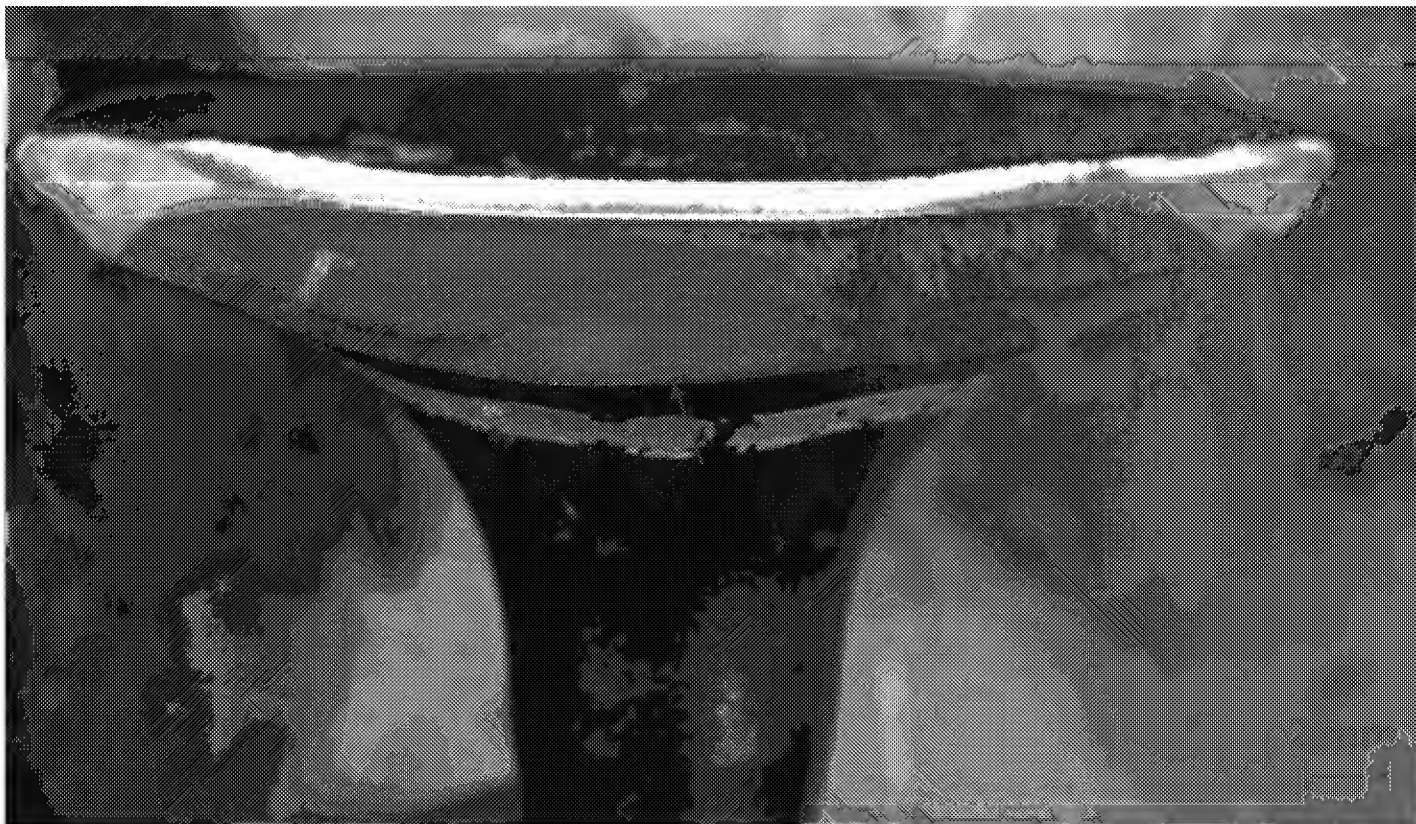


Figure 27: Fatigue Initiation Sites on Cylinder 3 Bottom Exhaust Valve, E15 Verado 1B812776

In addition to finding the fatigue initiation sites, the failed valves were checked for hardness. The cracked valves from the E15 engine were found to have hardness values much lower than new valves and below the minimum print specification of a new valve. Other sample valves were collected and analyzed from WOT endurance Verado engines that were run on E0 pump fuel during the same general timeframe as the E15 engine was run. In addition, samples of new valves were also acquired and analyzed. The hardness measurements showed that the valves from the engines operated on E0 fuel were actually harder than the new valves. The summary of hardness measurements are shown in Table 4. Note: All of the measurements were taken in the Rockwell A scale and converted to the Rockwell C scale due to the fact that the samples were mounted and polished to perform hardness measurements in the center of the cross section. This would negate any hardness effects from the mounting material.

Table 4: Verado Exhaust Valve Hardness Measurement Summary

Valve Description	Hardness (HRC)
E15: 1B812776 Cyl 3 Bottom	22
E15: 1B812776 Cyl 6 Top	22
E0: 1B812775 Cyl 3 Bottom	37.5
E0: 1B812775 Cyl 3 Top	36.5
E0: 1B812775A Cyl 3 Top	38
E0: 1B828629 Cyl 2 Top	37.5
New Valve #1	34.5
New Valve #2	34.5
New Valve #3	33
New Valve #4	33
New Valve #5	33.5

The Verado exhaust valves are made from Inconel 751, which is a heat-treatable alloy. This trait was used to estimate the metal temperatures experienced by the valves. The valve hardness data in Table 4 collected from the E0 engines

suggested that the metal temperatures experienced during operation were in a range that allowed age-hardening of the metal to make the valves increase in hardness. The hardness values of the E15 engine valves suggested that they were operating in a temperature regime that significantly reduced the hardness. In order to understand the hardness versus temperature, the new valves that were hardness checked were heated in an oven for 24 hours at various temperatures and then hardness was checked again. Figure 28 shows the results from the oven heating operation on the new valves. In Figure 28, the blue line shows the hardness data of the new valves before heat treatment and the red line shows the hardness data of the valves after heating. At metal temperatures above 870°C, the valves showed a dramatic decline in hardness according to this test data. The data suggest that the exhaust valves from the E15 engine may have experienced temperatures nearing 900°C.

One possible mechanism by which the E15 exhaust valves may have experienced such high temperatures would be a disruption of valve cooling during the portion of the cycle where the valve should be fully seated. During inspection, it was noted that several cam lobes showed wear and marking on the base circle portion of the lobe indicating that the exhaust valves had run out of lash. This suggested that excessive wear or valve head deformation may have occurred during operation, which caused the lash to diminish. This would have prevented the valve from seating properly resulting in a significant valve temperature increase due to lack of cooling on the seat. The valves or seats may have also had accelerated wear to diminish the lash due to lack of lubricity of the E15 fuel or because of the elevated temperatures caused by the lean operation on E15 fuel. In addition, if the exhaust valves were experiencing higher operating temperatures due to the higher exhaust gas temperatures from using E15 fuel, the overall length of the valve would be slightly longer. This longer length during operation would also reduce the amount of lash in the valvetrain and make the engine more prone to base circle contact on the cam. Plots comparing the measured cold valve lash over the course of endurance between the E0 and E15 engines are shown in Figures 32 and 33 below.

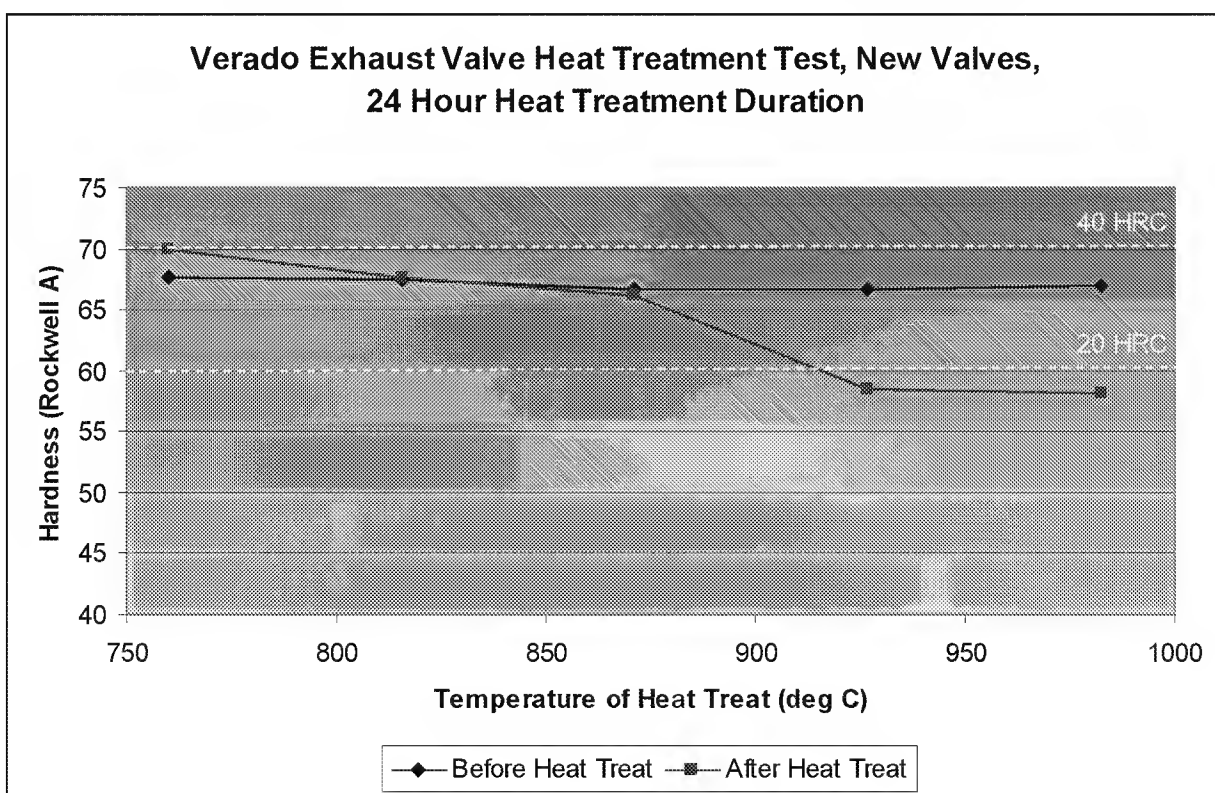


Figure 28: Heat Treatment Test of New Verado Valves

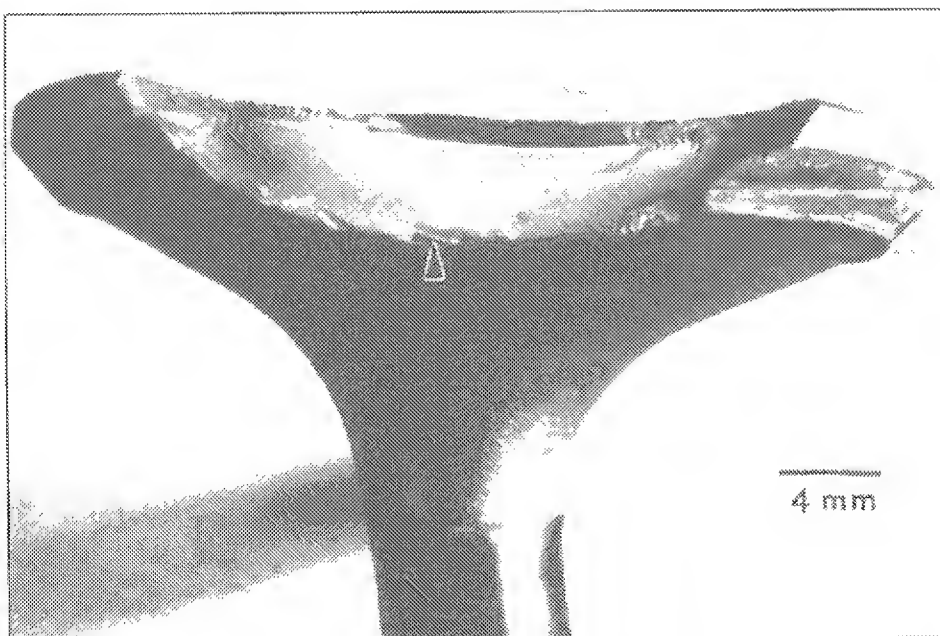


Figure 6.8 Example of valve fillet fractures due to overstress, at elevated temperatures, and a corrosive environment; the arrow shows the crack initiation site at the fillet (Wang et al.).

Figure 29: Exhaust Valve Failure from Literature Research Showed Similar Failure Mechanism⁸

Similar failure mechanisms were found in a literature search as shown in Figure 29. The failure is noted as a classic over-temperature failure. *"High temperatures and a corrosive environment at the exhaust fillet substantially weaken the valve strength."*⁸ from: Introduction to Engine Valvetrains by Yushu Wang

Extensive development went into the valvetrain on this high-output engine. Upgrading the engine to account for higher exhaust gas temperatures due to a wider range of fuel properties would not be easily accomplished. The current production Verado exhaust valve is Inconel 751, which is categorized in the "superalloy" material classification.

It should be noted that the E15 engine (1B812776) was operating for a period of time when the mineral precipitation problem occurred on the second E0 engine (1B812775A). However, it is not believed that this contributed to the valve failure. The E15 engine (1B812776) did have some accumulation of precipitation flakes in the exhaust collector area, but not nearly to the extent that the E0 engine did. The E15 engine (1B812776) was not operating the entire time the E0 engine (1B812775A) ran when the mineral precipitation problem occurred. The head was sectioned and there were no mineral precipitation deposits on cooling jacket surfaces in cylinder 3 where the worst valve failure occurred. See Figure 30 for a picture of the sectioned head from the E15 engine (1B812776) showing no mineral deposits were present. Yellow spots in the cooling jacket were anti-corrosion coating from production where the paint did not fully coat interior surfaces of the cooling jacket. Figure 31 shows the same section of cylinder head from the E0 engine (1B812775A) that failed due to the mineral precipitation. This E0 engine (1B812775A) was also inspected for cracked exhaust valves and none were found. In addition, the hardness values of the exhaust valves were measured (see Table 4) indicating that the mineral precipitation issue did not affect the valve hardness on the E0 engine (1B812775A). There were several other Verado engines that were running endurance testing for a different project that failed due to the mineral precipitation issue. All other Verado engines that failed due to the mineral precipitation failed the head gasket in the exhaust collector area.

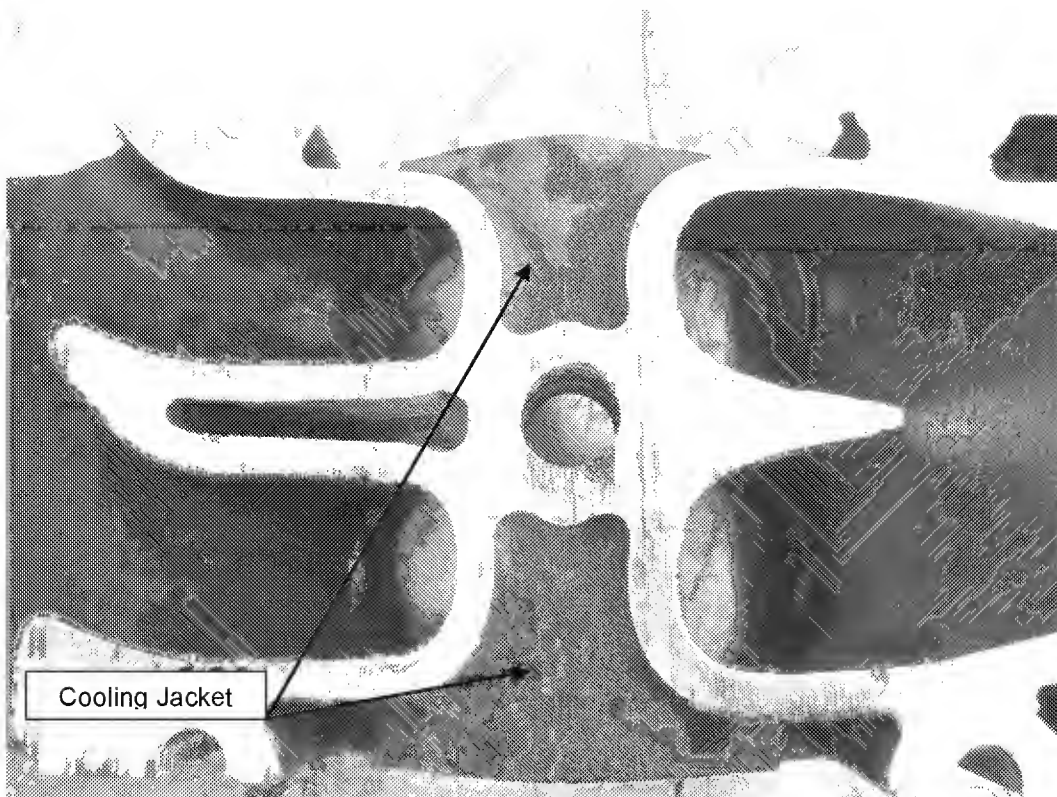


Figure 30: Photo of Section of Cylinder 3, E15 Verado 1B812776, Exhaust Ports on Left

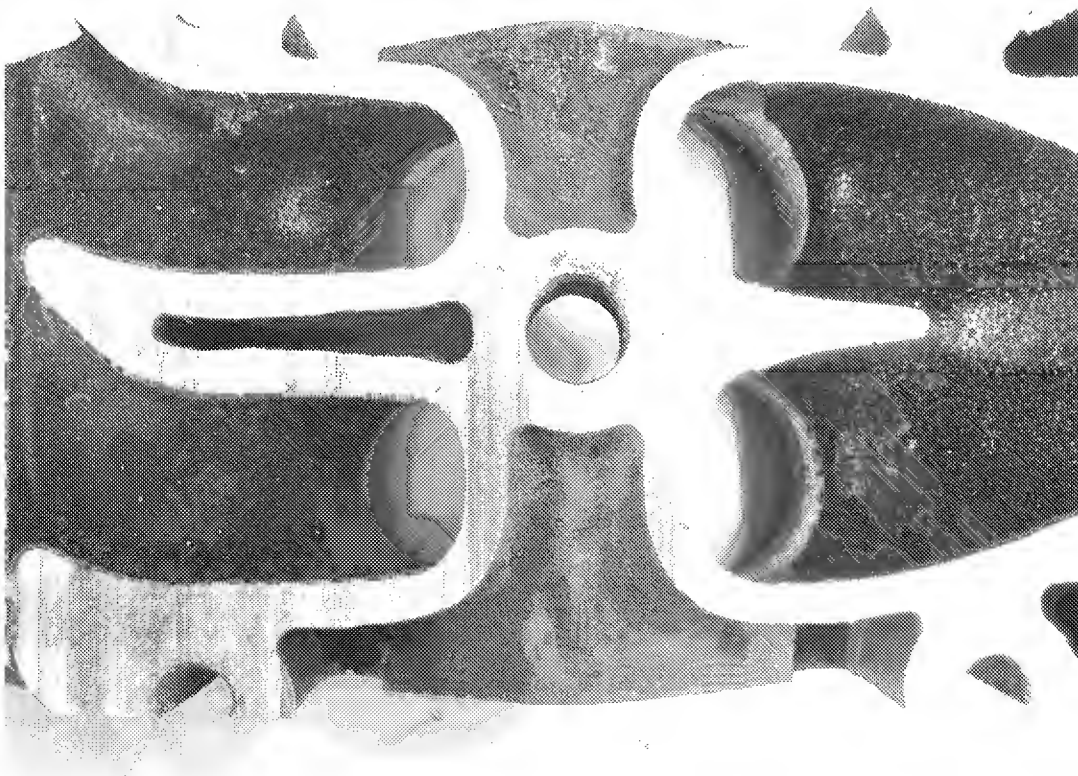


Figure 31: Photo of Section of Cylinder 3, E0 Verado 1B812775A, Exhaust Ports on Left

E0 Substitute Engine: In lieu of a completed test on E0 fuel, a substitute engine was chosen that had already been through endurance testing (serial number 1B828592). The engine that was used as a substitute had completed 372 hours of WOT endurance testing and was still intact. It ran in the same test facility running under the same test procedure as all other endurance testing as part of this project. The engine was used for a gearcase durability test for a different project so the rest of the engine was completely stock and built on the production line as were the other engines in this project. As such, it provided a suitable replacement for the incomplete E0 tests. For reference, the replacement engine (1B828592) was on test between the following dates: 11/15/2010 through 12/14/2010. The E15 engine 1B812776 was on test between 9/21/2010 through 11/12/2010.

As part of routine maintenance and checks during endurance, several valve lash measurements were taken at various intervals on the E0 substitute engine. Figures 32 and 33 below show the lash measurements during the course of endurance for both the E0 substitute engine (1B828592) and the E15 engine (1B812776), respectively. The solid red lines in the graph indicate the upper and lower lash specification on a new engine. It is clear from the lash measurements on the 2 engines that the E15 engine had a significantly faster decline in lash than the E0 substitute engine. The E0 substitute engine had 1 valve with higher lash value at the end of testing. There may have been some carbon or other deposits holding this valve off the seat during the measurement.

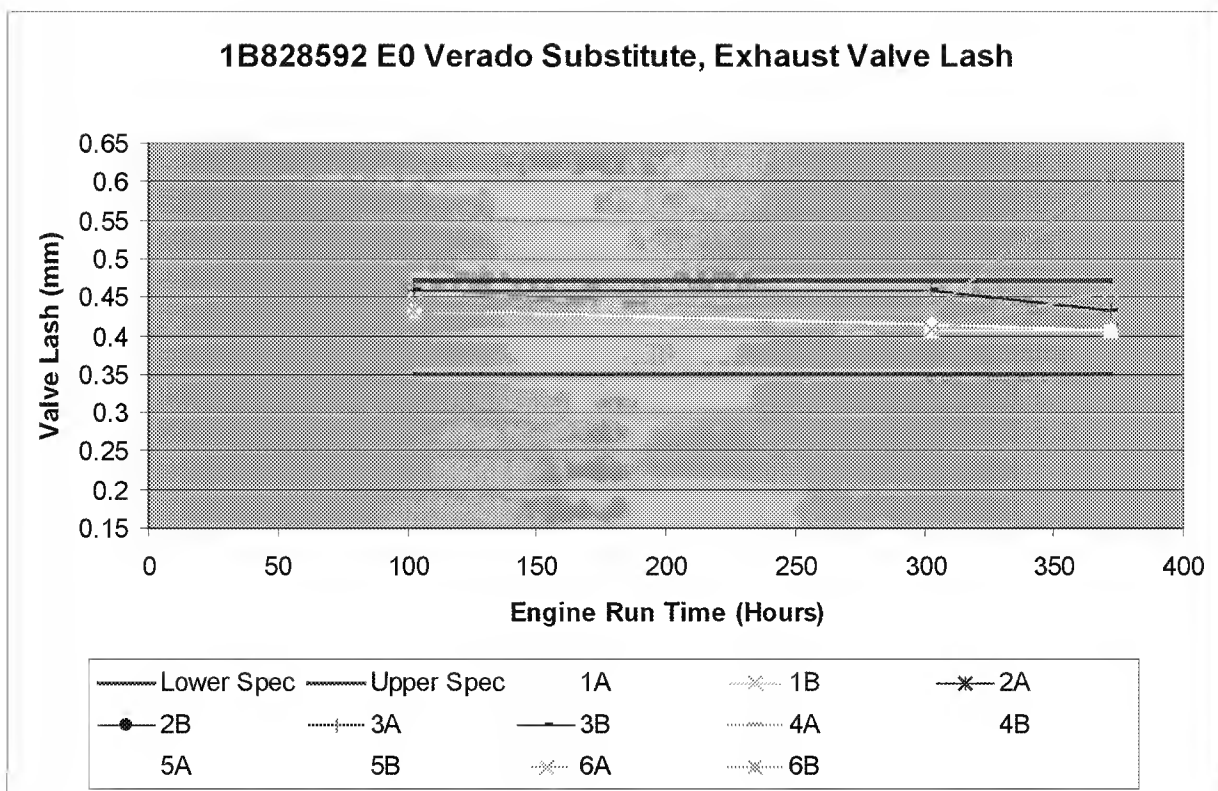


Figure 32: Exhaust Valve Lash (Measured Cold) vs. Endurance Time, E0 Substitute Engine

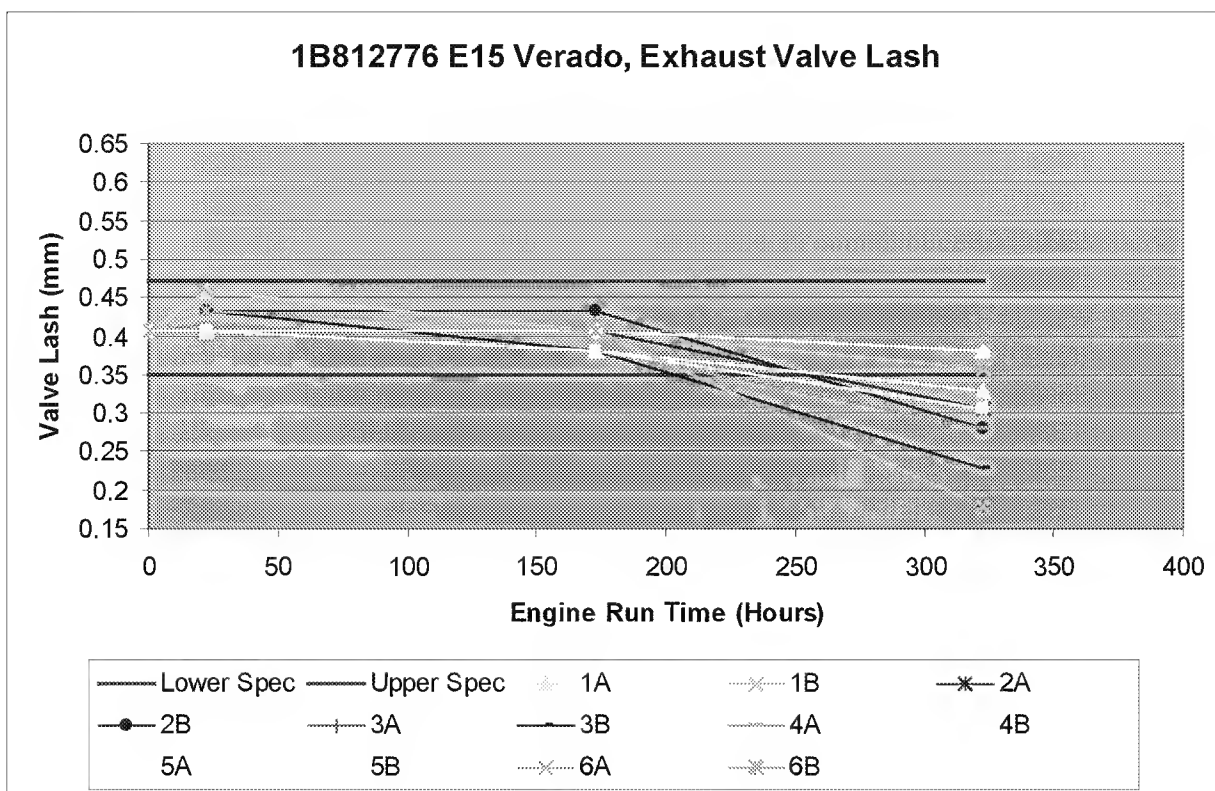


Figure 33: Exhaust Valve Lash (Measured Cold) vs. Endurance Time, E15 Engine

Emissions Testing Results

Due to failures of both the E0 and E15 engines, a complete analysis of the deteriorated emissions was not possible. However, with the data available several conclusions could be made. Figure 34 shows a graph of the Verado emissions that were collected. As was the case for the 9.9HP emissions data plots, each data point on the curve represents the average emissions value of the 3 emissions tests performed at each interval with error bars showing the range of the 3 emissions tests. The dashed yellow line shows the data from the original E0 engine (serial number 1B812775). The solid red and blue lines show the emissions data from the E15 engine (serial number 1B812776) using E15 and E0 (EEE) fuels, respectively. The single point in light blue at 372 hours shows the end of test emissions results for the substitute E0 engine (EEE fuel, serial number 1B828592). The graph shows a generally declining HC+NO_x trend for the 2 original engines which is typical of Verado engines. The declining emissions trends on both engines would suggest that the ethanol fuel blend did not adversely affect the emissions deterioration on the Verado engine. The most notable aspect of the emissions output on the E15 engine was the fact that the total HC+NO_x on E15 fuel was above 25 g/kw-hr, whereas the value on EEE-E0 was 21.5 g/kw-hr. The Family Emissions Limit (FEL) was set to 22 g/kw-hr for this engine family. A Verado engine generating 25 g/kw-hr would have failed an emissions audit. The increase in emissions can be primarily attributed to a significant increase in NO_x due to the lean operation. Since the Verado is a highly boosted engine it is very sensitive to NO_x generation due to changes in equivalence ratio. However, there was also an increase in HC emissions due to the E15 fuel, which would not be expected with a leaner equivalence ratio.

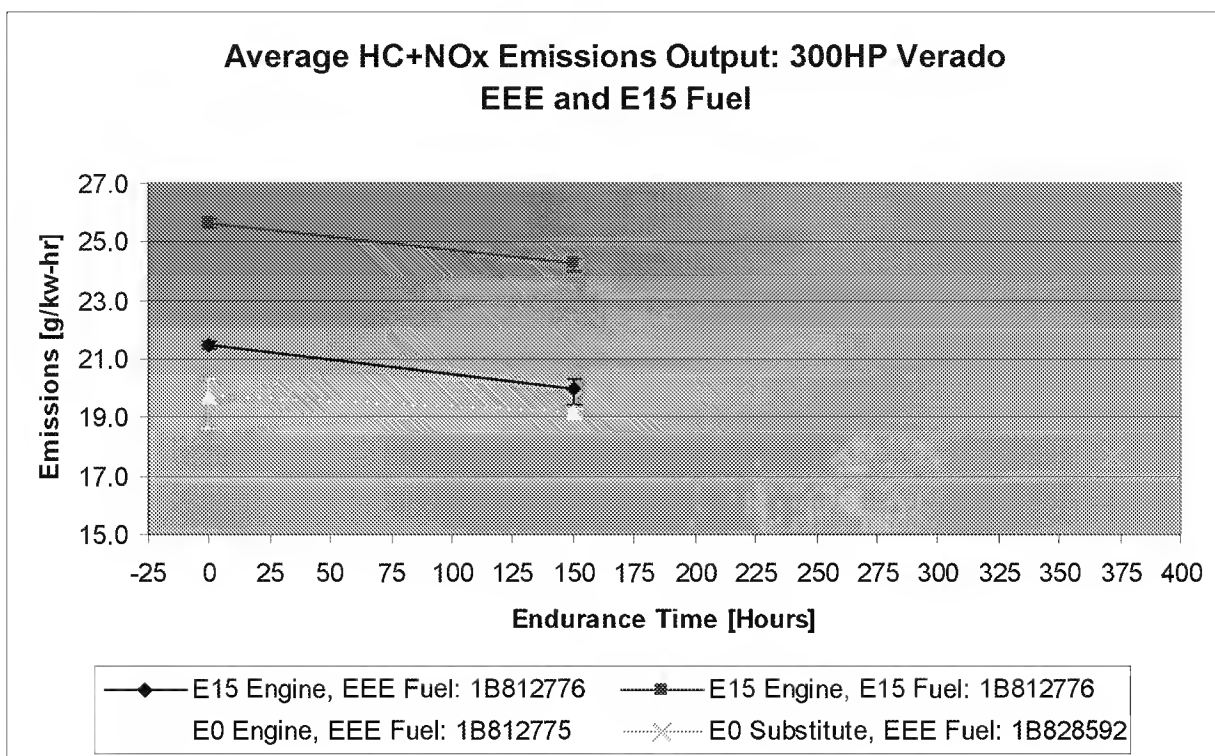


Figure 34: 300HP Verado HC+NOx Emissions Results Summary

In order to better understand the differences in the emissions outputs between the 2 fuels, graphs were made for each constituent of interest. Figures 35 through 37 show the NOx, HC, and CO emissions differences. The graphs were broken down by mode point for emissions tests performed prior to endurance on the E15 engine (1B812776). The values shown are the averages of the three repeated runs at “zero” hours.

Figure 35 shows the NOx emissions trends for the 2 fuels. The main differences were at Modes 1 and 2 which were both high load, boosted operating points. The fact that the NOx increased significantly with a lean shift due to the ethanol fuel blend was not surprising. Modes 3 and 4 did not show much difference because the engine was calibrated near an equivalence ratio of 1 on E0 fuel. The NOx trend with respect to equivalence ratio was near the peak at these points so a lean shift did not result in a significant change in NOx. Mode 5 was idle so the NOx generation at that point was essentially zero.

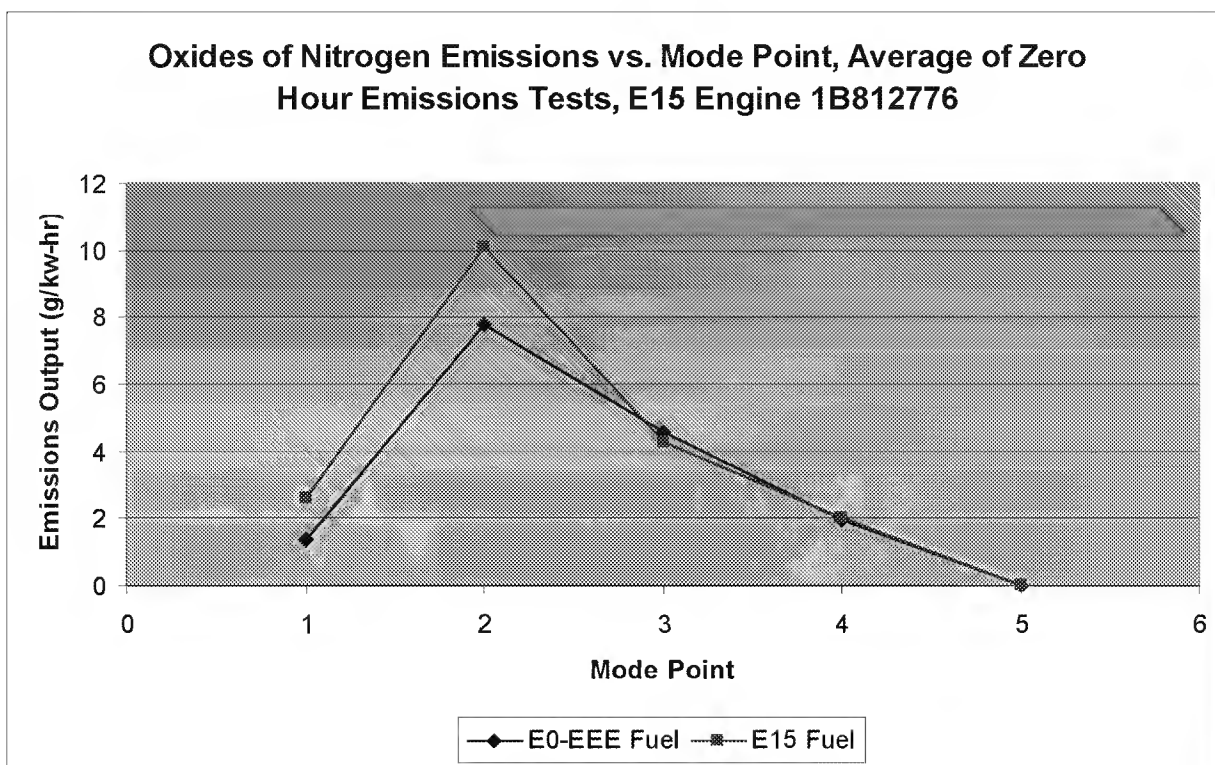


Figure 35: 300HP Verado NOx Emissions Results by Mode Point, Representative Zero Hour Test Data

The increase in HC output on E15 fuel was not an expected outcome of the test. Figure 36 highlights the difference in HC emissions between the 2 fuels. The main difference occurred at Mode 3, so further investigation was necessary into Mode 3 data specifically. However, it was also apparent that the HC output on E15 fuel was higher at Modes 1-4 despite the leaner operation from the fuel chemistry. This may suggest that the vaporization of the E15 fuel was inferior to that of the EEE fuel leading to poor fuel preparation. This is supported by data from Modes 1 and 2 where NOx and CO trends show that the engine did run leaner, yet had higher HC output when operated with E15.

The HC difference at Mode 3 was likely a result of the engine running substantially leaner than lean best torque (LBT). In this operating region, the Verado engine is calibrated slightly lean of the stoichiometric mixture on E0 fuel. With the use of E15 fuel, the engine operates significantly lean of LBT and, therefore, the torque production diminishes significantly. As a result, to achieve the specified torque set point for Mode 3 the throttle input had to be increased, yielding higher airflow and higher fuel flow. The fuel flow increased nearly 10% for essentially the same torque production with E15 fuel. In addition, it was noted that the intake air temperature was 12°C cooler at Mode 3 with E15 fuel. The cooler charge temperature was likely a result of the increased fuel vaporization cooling effect from the ethanol. The cooler temperatures in the intake may have impaired fuel preparation. The higher fuel flow combined with the inferior fuel preparation was likely the cause of the high HC output at Mode 3.

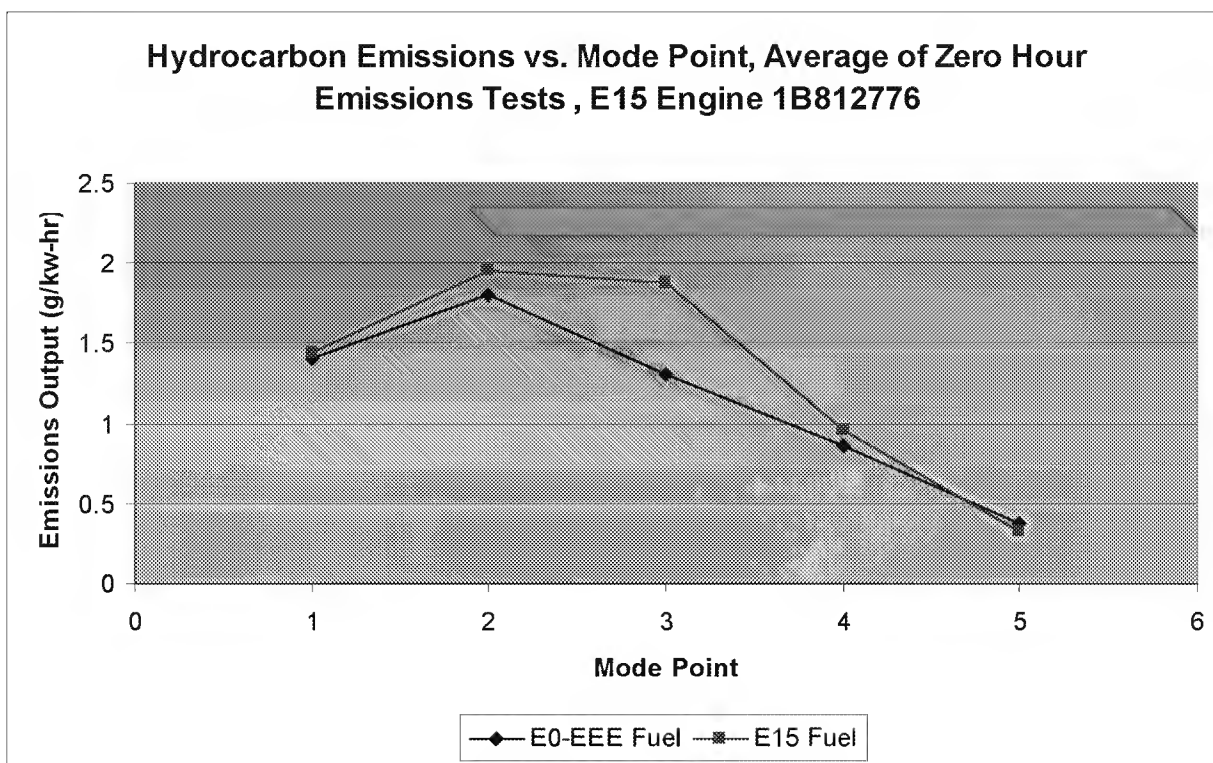


Figure 36: 300HP Verado HC Emissions Results by Mode Point, Representative Zero Hour Test Data

The CO emissions vs. emissions test mode point are shown in Figure 37. There was a significant reduction in CO emissions at Modes 1 and 2 when the engine was operated on E15 fuel, as expected. Modes 1 and 2 are calibrated rich of a stoichiometric mixture on E0, so the enleanment from E15 caused a reduction in CO. Modes 3-5 are generally insensitive in regard to CO because the operating points are calibrated near the stoichiometric mixture, so leaning the engine out due to the fuel had little effect at reducing CO relative to the changes seen at Modes 1 and 2.

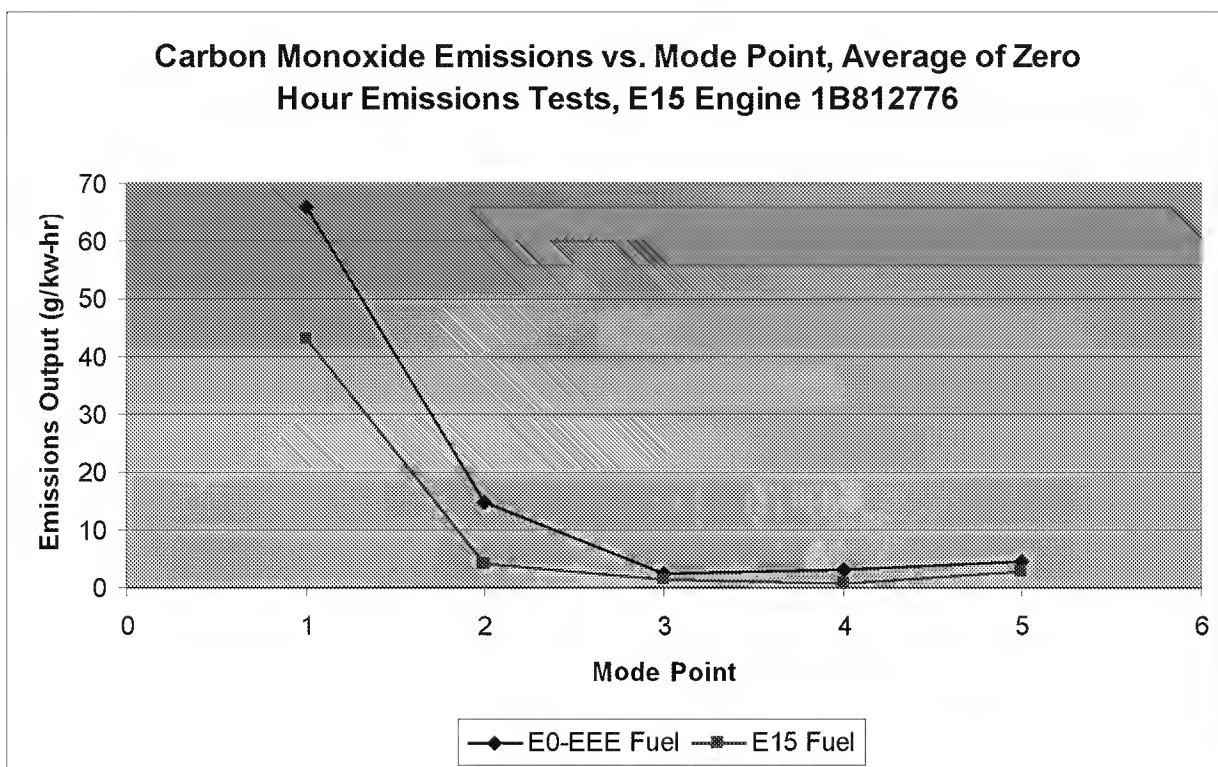


Figure 37: 300HP Verado CO Emissions Results by Mode Point, Representative Zero Hour Test Data

Engine Performance Comparison

Due to the engine failures, a complete comparison of engine performance vs. run time was not possible. The normalized power and torque data from the E0 Verado is shown in Figure 38. The changes from zero hours to 150 hours were less than 1% for peak torque (negligible) and a 2.3% reduction in peak power. The E0 engine produced less power output than the E15 engine when operated on the same E0 fuel. This difference of approximately 2% is considered normal production engine-to-engine variability.

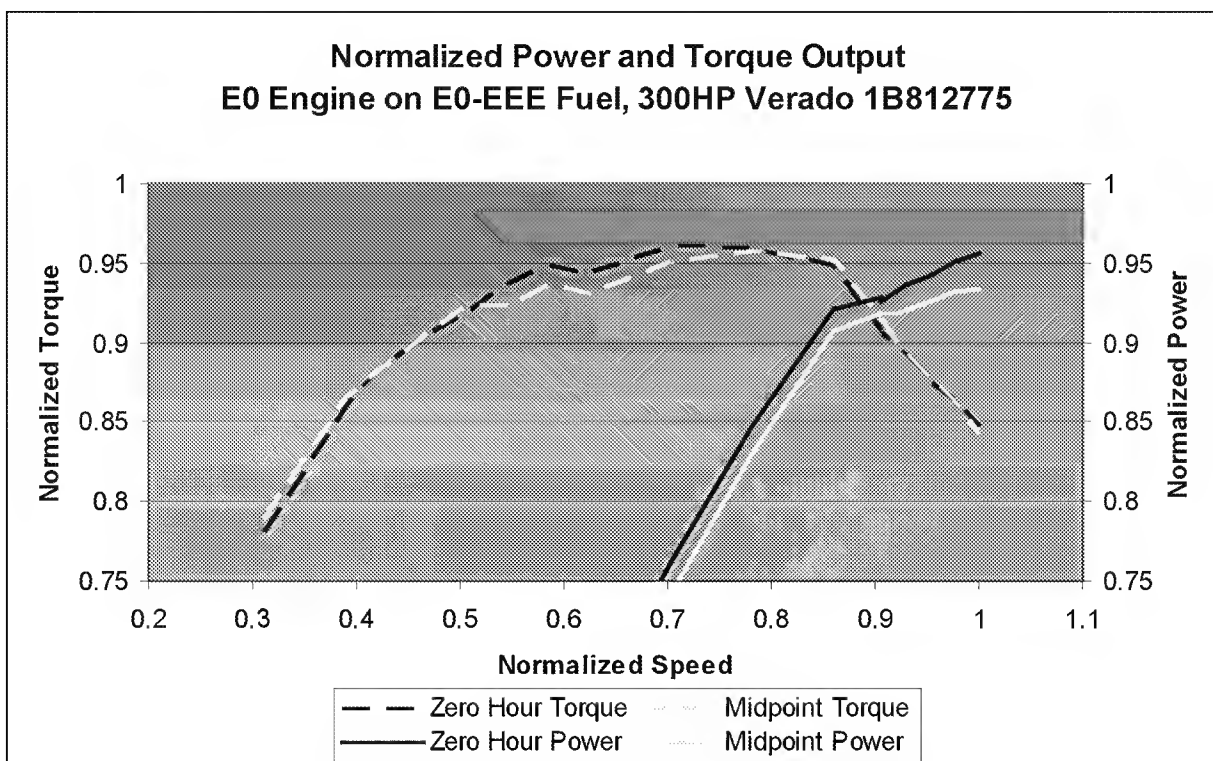


Figure 38: E0 Engine Power and Torque Output at Endurance Check Intervals-EEE-E0 Fuel

Power and torque data (normalized) for the E15 engine on both EEE-E0 fuel and E15 fuel is shown in Figure 39. There was an improvement in peak torque of 3.0% and in peak power of 1.5% when comparing the zero hour and midpoint runs on E0-EEE. The E15 engine showed negligible differences when comparing the midpoint power runs on E0-EEE and E15. It is unclear why this engine seemed unresponsive to the differences in charge cooling afforded by the ethanol blend fuel. Note: There was not a power run completed on E15 fuel at the initial zero hour measurement, which is why the midpoint data is compared in these figures.

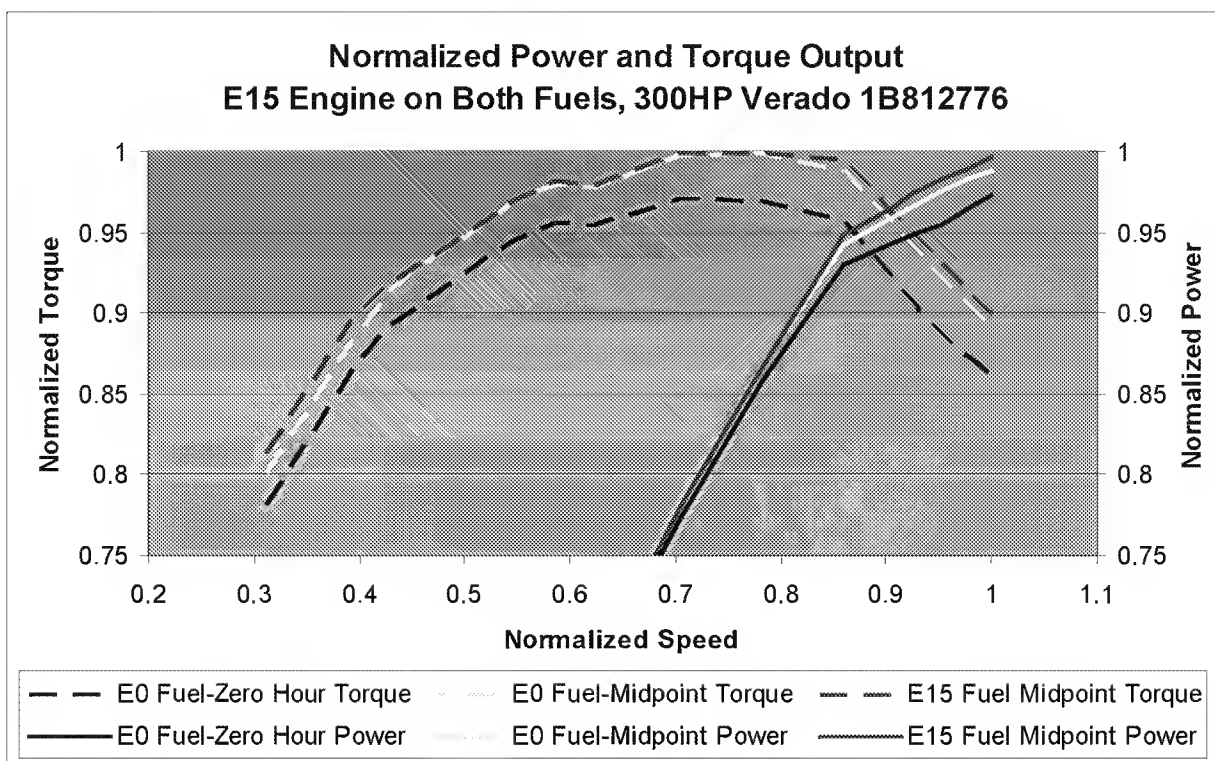


Figure 39: E15 Engine Power and Torque Output at Endurance Check Intervals-EEE-E0 and E15 Fuel

Figure 40 shows the difference in exhaust gas temperatures during power runs at the midpoint check on the 2 different fuels. There was up to a 30°C increase in EGT when operating on E15 fuel.

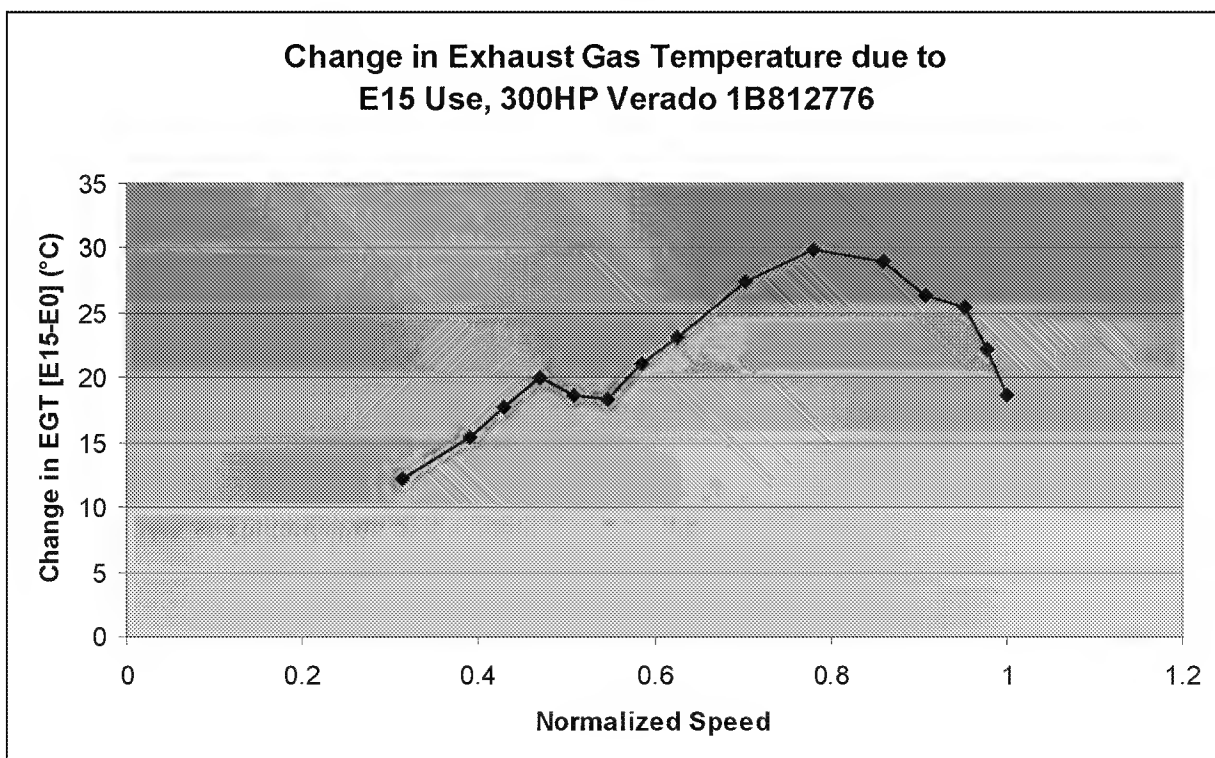


Figure 40: E15 Engine-Exhaust Gas Temperature Change at Wide Open Throttle, EEE-E0 to E15 Fuel

End of Test Teardown and Inspection

After all running engine tests were completed, the engines were disassembled and inspected. There was visual evidence that some of the internal components from the Verado E15 engine had experienced higher operating temperatures.

Upon disassembly, there were differences noted in the condition of the pistons from the 2 engines. Figure 41 shows pictures comparing the pistons from cylinder 2 from each engine. The piston from the E15 engine had a significantly higher amount of oil staining and carbon deposits than the piston from the E0 engine. The staining and deposits were noted on nearly every surface of the E15 piston compared with the E0 piston. Additionally, the pistons were sent to the metallurgy lab for hardness measurements. The hardness measurements were taken at several locations on the crown of the piston as well as a location on the internal portion of the piston just above the wrist pin bore after being sectioned. The average crown hardness of the E0 piston was 67.5 BHN (Brinell Hardness Number) while the E15 piston crown was 66.9 BHN. The internal piston hardness above the wrist pin bore was 74.1 BHN for the E0 piston and 71.5 BHN for the E15 engine's piston. Although the hardness measurements showed no effect of operating temperature on material properties, differences in visual appearance suggest that the E15 pistons operated at higher temperatures during running than the E0 pistons.

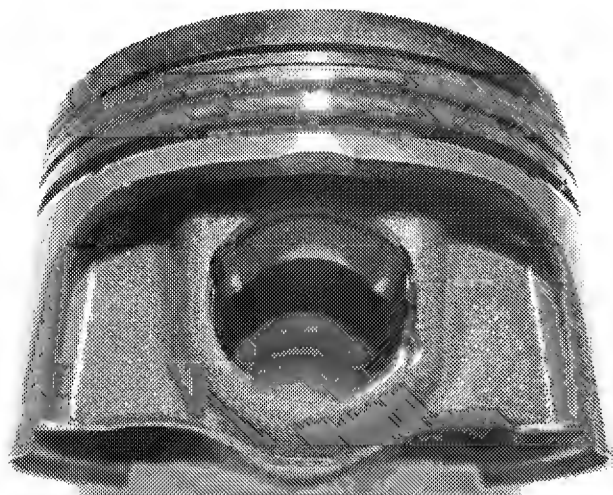


Figure 41: Piston Carbon Deposit Comparison, Cylinder 2, E0 on Left, E15 on Right



Figure 42 shows the small end of the connecting rods from each engine. The carbon deposits indicate that the E15 rods likely ran at higher operating temperatures. The carbon deposits on the rods are consistent with the carbon deposits observed on the pistons.

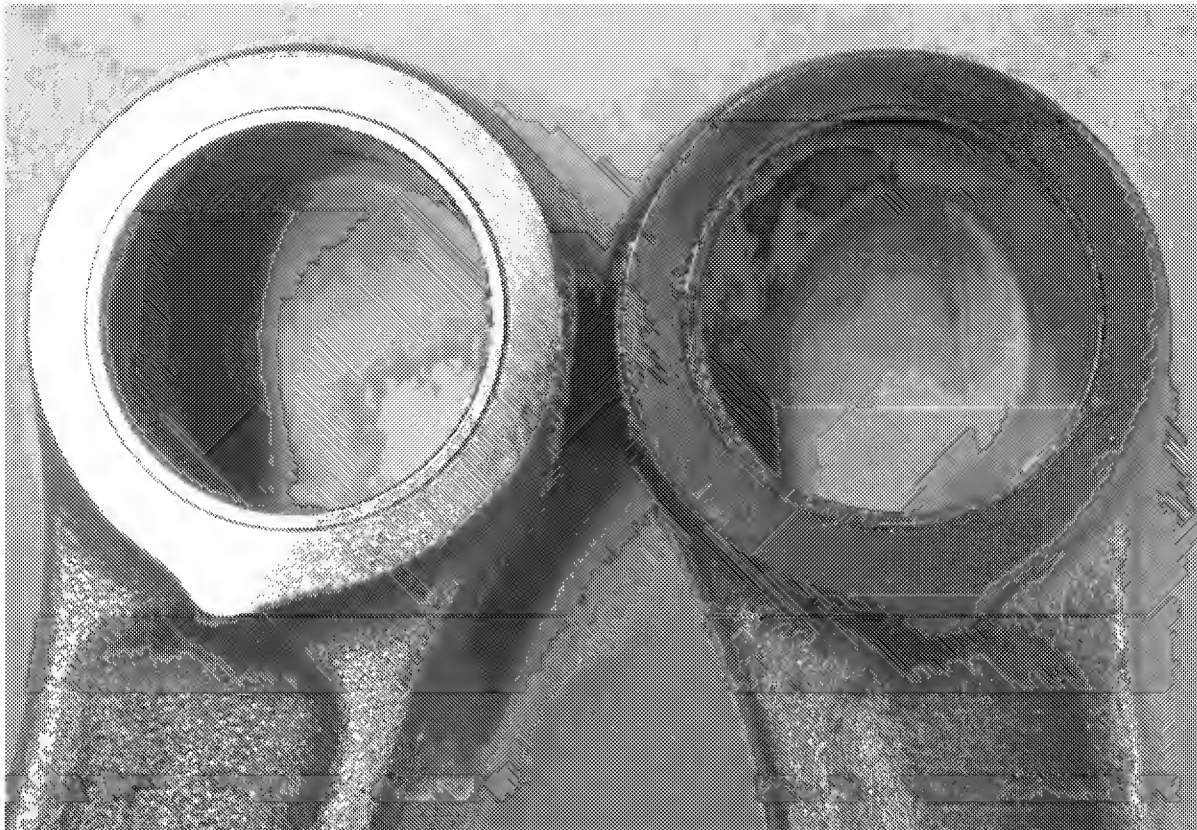


Figure 42: Connecting Rod Carbon Deposit Comparison, Cylinder 2, E0 on Left, E15 on Right

The exhaust valves were also closely inspected on the substitute E0 engine in order to compare with the valves that cracked on the E15 engine. With 372 hours of endurance aging time accumulated, no cracked valves were discovered during inspection under a microscope. The average hardness values of the exhaust valves from cylinder three of the E0 engine were 37.3 and 37.7 HRC. These values were consistent with other engines that were operated on E0 as indicated in Table 4.

During disassembly, the E15 engine was noted as having base circle contact on several of the exhaust cam lobes as noted above. The exhaust cam lobes from the substitute E0 engine did not show signs of base circle contact. The lash measurements shown in Figures 32 and 33 support these observations. A picture showing the difference in wear on the base circles of the exhaust cam lobes can be seen in Figure 43. The picture shows the E15 exhaust cam on the right and the E0 cam on the left. The wear pattern on the E15 exhaust cam lobe is apparent.

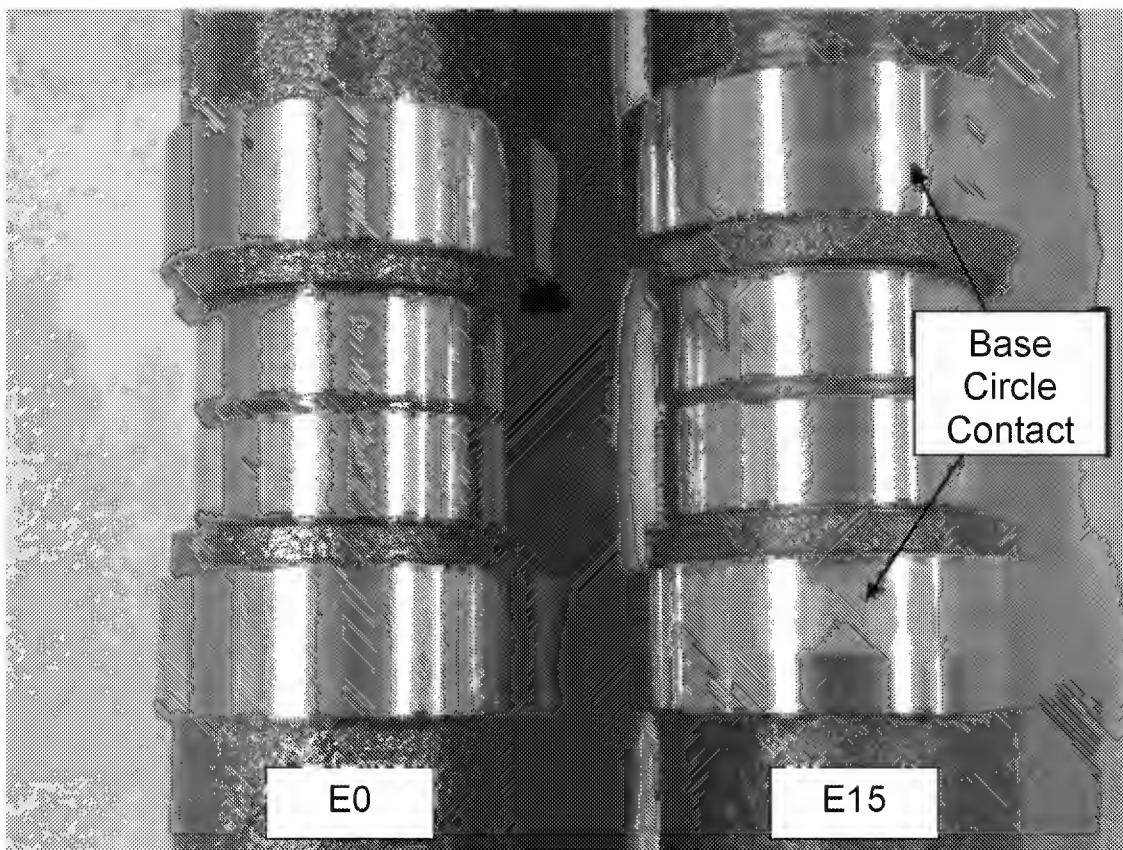


Figure 43: Exhaust Cam Lobe Base Circle Detail, Cylinder 3, E0 on Left, E15 on Right

200 EFI Two-Stroke:

Endurance Test Results

An engine failure prevented successful completion of the full endurance period for the 200 EFI E15 engine. The 200 EFI E15 engine failed a rod bearing before the completion of the endurance test. The 200 EFI E0 engine completed the 300 hour endurance test and all post-endurance dynamometer tests.

The E15 endurance engine failed at 283 total engine hours and had accumulated 256 hours of WOT endurance at the time of failure. Upon inspection it was found that the big end connecting rod bearing had failed on cylinder 3. The rod cap was still bolted to the rod after the failure. This engine family uses a fractured rod cap design with a roller bearing (typical for a two-stroke vs. a plain bearing in a four-stroke). Images of the remaining bearing cage and the damaged rod along with undamaged pieces for reference are shown in Figure 44. No rollers were found during teardown and were likely ejected from the bearing and made their way through the power cylinder and out the exhaust. There was extensive damage to the top of the piston on cylinder 3 indicating that the rollers went through the power cylinder. Due to the extensive damage to the bearing and connecting rod (since it failed at rated speed, full power) and the fact that not all of the pieces were recovered, root cause of the bearing failure was not conclusively determined. Little is known about the effects of ethanol blends on oil/fuel mixing and dispersion on total loss lubrication systems, such as the one on this engine family. More investigation is needed to understand if ethanol would negatively impact the lubrication systems on two-stroke engines.

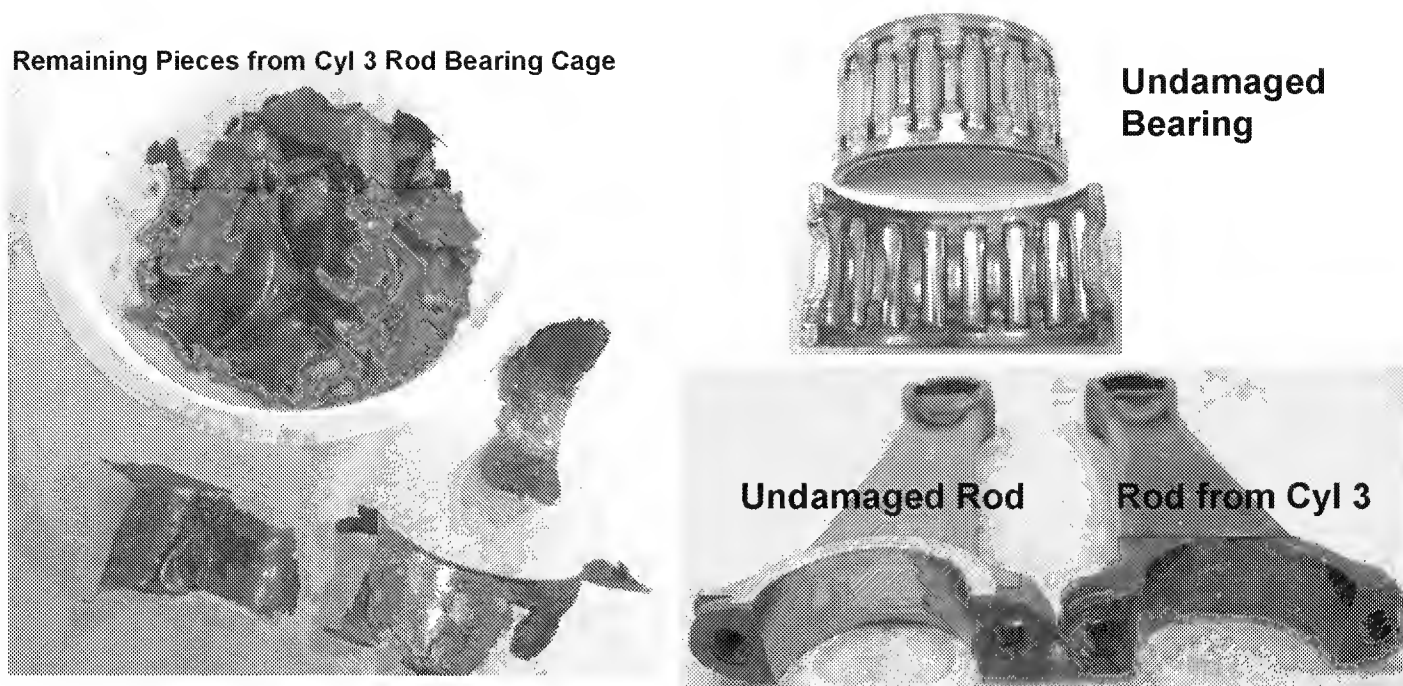


Figure 44: 200HP EFI Bearing Failure Pictures

Emissions Testing Results

As a result of the engine failure, a complete set of emissions data was not collected on the 200 EFI. However, conclusions can be drawn from the data that were collected. Figure 45 shows a summary of HC+NO_x results from the emissions test on both engines. As Figure 45 shows, there was more variability in the E0 engine than on the E15 engine. E15 fuel did not have a detrimental effect on emissions degradation on this engine family. It is worth noting that of the roughly 120 g/kw-hr of HC+NO_x, the NO_x contribution is approximately 2 g/kw-hr. Since the HC is roughly 98% of the total HC+NO_x, graphs depicting the changes in the individual constituents were left out of this report. The relative enleanment from the E15 fuel did slightly increase the NO_x emissions, but that was not significant in comparison with the HC contribution.

The CO emission results from the 200 EFI engines are shown in Figure 46. The E15 fuel resulted in lower CO emissions, as expected due to the relative enleanment from the difference in fuel chemistry. Both engines and both fuels showed the same trend of increasing CO with more endurance time.

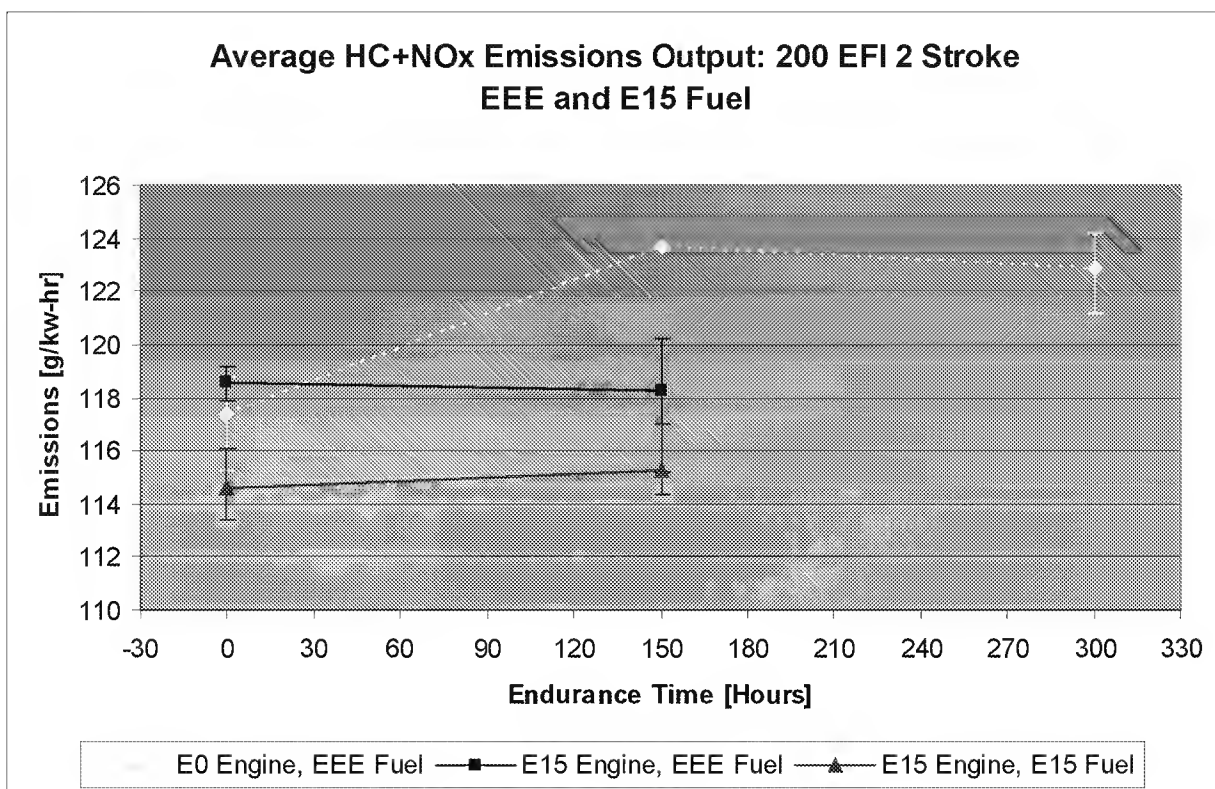


Figure 45: 200HP Two-Stroke HC+NOx Emission Results Summary

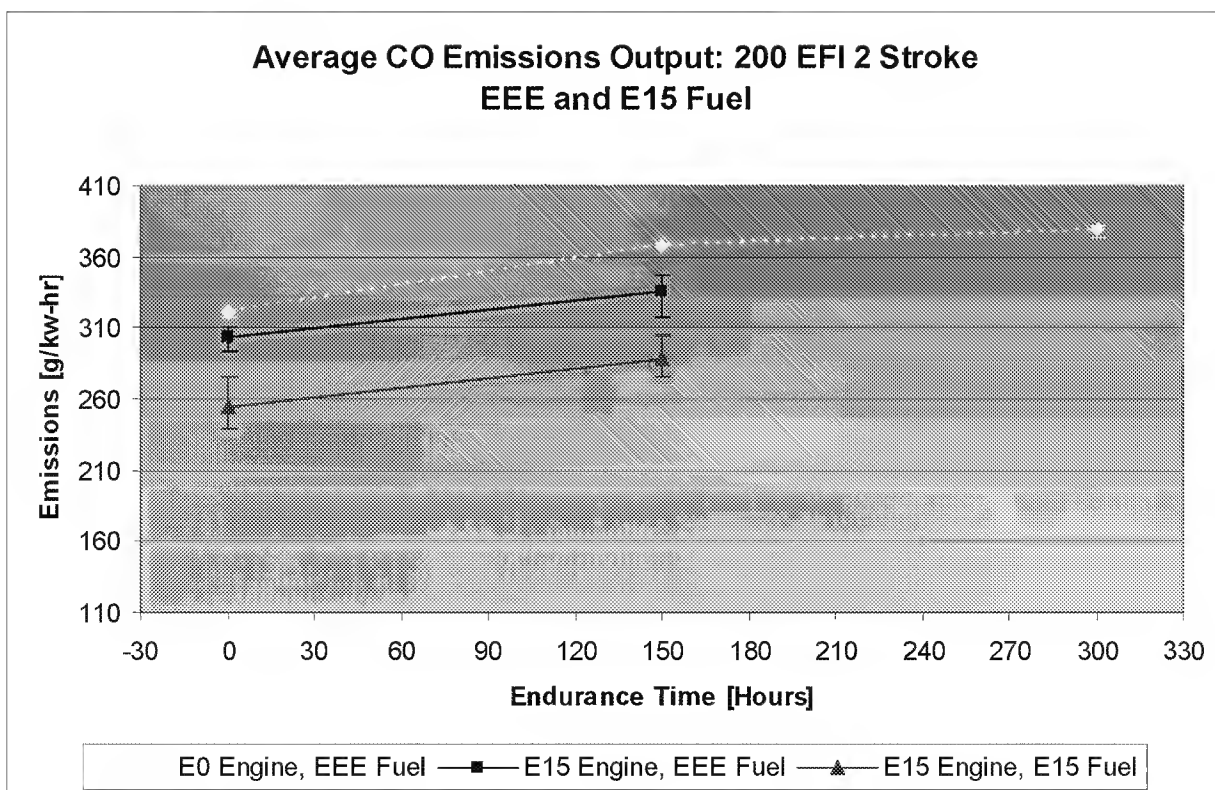


Figure 46: 200HP Two-Stroke CO Emission Results Summary

Engine Performance Comparison

The power and torque data (corrected per ISO 3046-1) from the E0 200HP EFI engine are shown in Figure 47. There were slight differences in the curves, but the changes from zero hours to 300 hours were less than 1% for both peak torque and peak power.

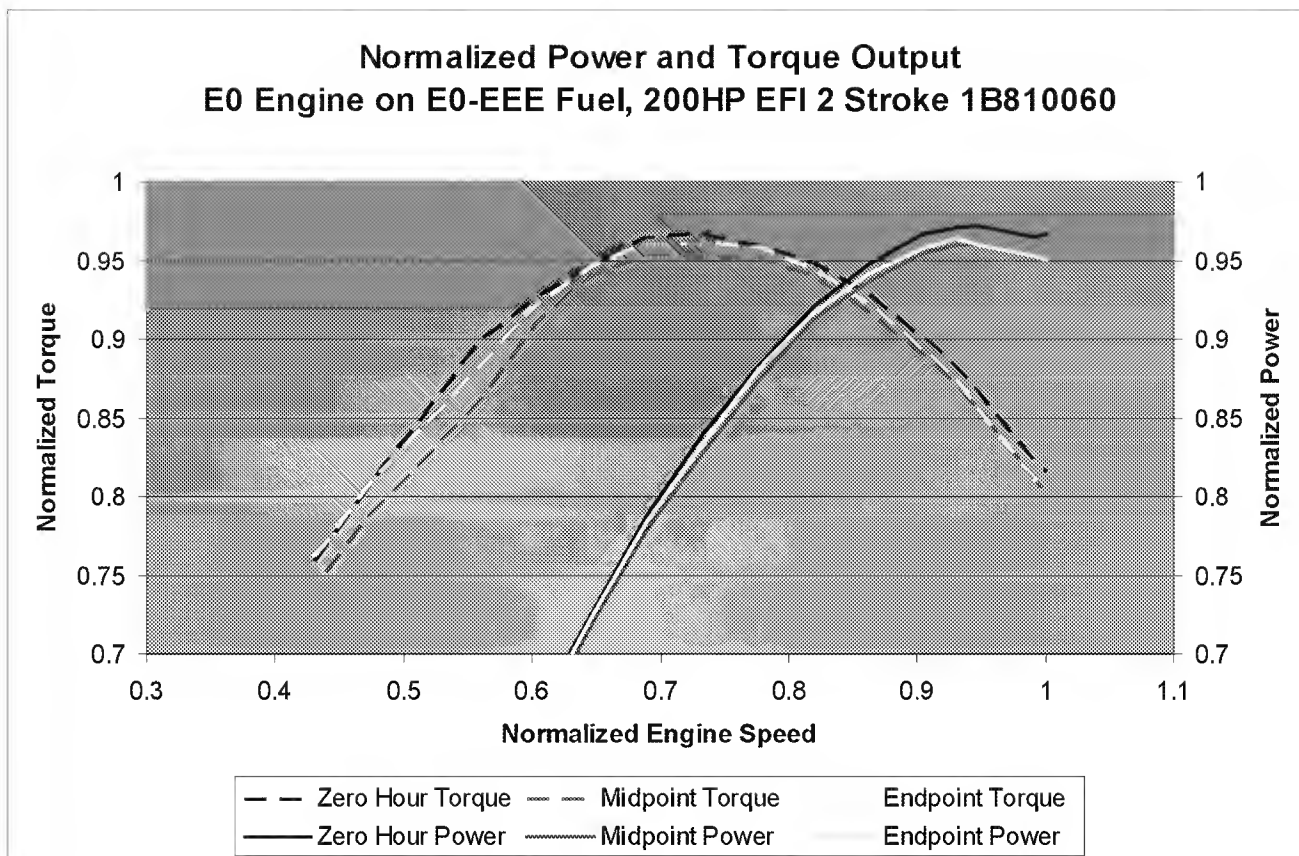


Figure 47: E0 Engine Power and Torque Output at Endurance Check Intervals-EEE-E0 Fuel

Data for the E15 engine on both EEE-E0 fuel and E15 fuel are shown in Figure 48. A comparison of the output at the zero hour and 150 hour checks are included. Similar to the E0 engine, there was less than a 1% change from the zero hour check to the 150 hour check for both the peak torque and peak horsepower for either fuel. There was an increase of approximately 2% in both peak torque and peak power when changing from E0 to E15 fuel. The engine may have been operating in a range closer to the Lean Best Torque on the E15 fuel due to the enleanment from the fuel change and/or the volumetric efficiency may have been better due to the additional charge cooling of the ethanol fraction. Figure 49 shows the difference in exhaust gas temperatures during the same power runs on the 2 different fuels. Since this was a 6 cylinder engine and individual cylinder measurements were possible, the average and maximum changes in EGT were plotted for clarity. On average use of the E15 fuel resulted in a 15-20°C increase in EGT in the range of frequent steady-state operation (>4500 RPM). The maximum increase in EGT for any individual cylinder when using E15 was 28°C.

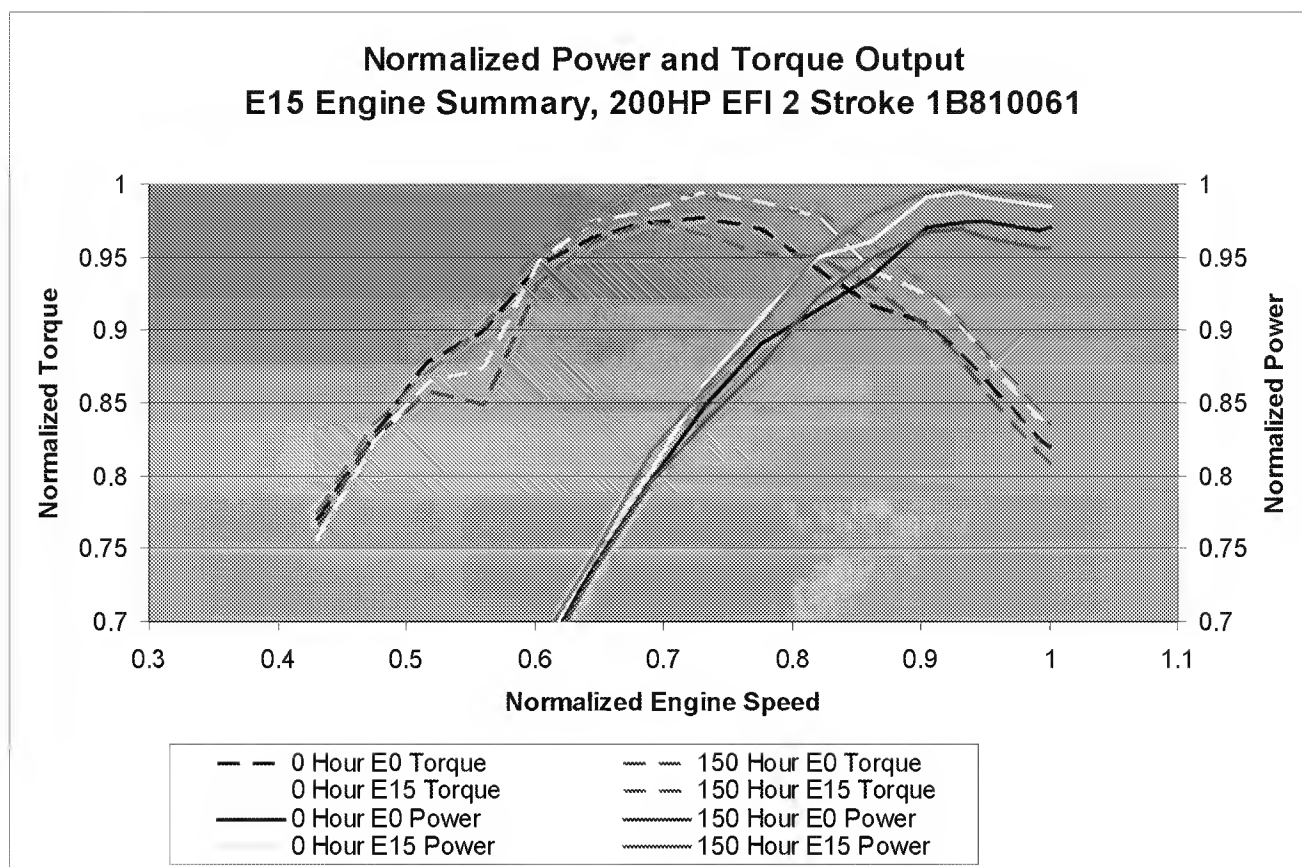


Figure 48: E15 Engine Power and Torque Output at Endurance Check Intervals-EEE-E0 and E15 Fuel

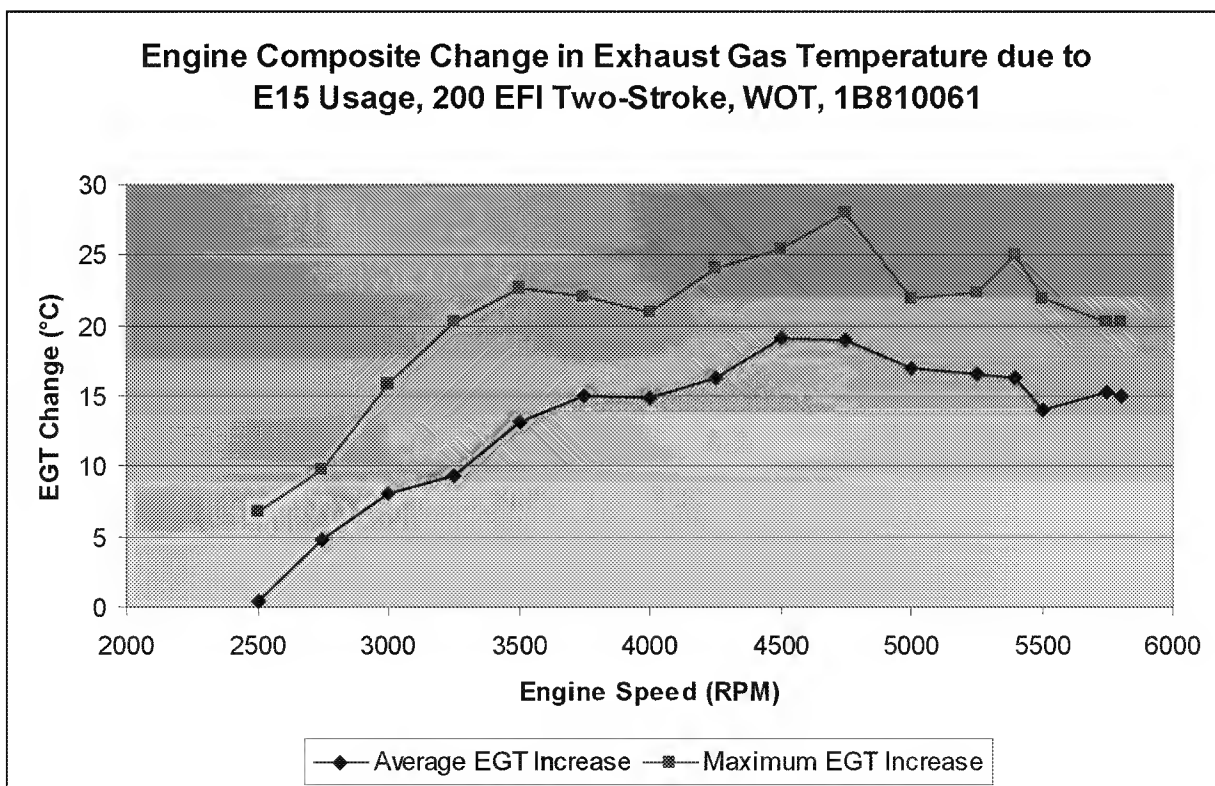


Figure 49: E15 Engine-Exhaust Gas Temperature Change at Wide Open Throttle, EEE-E0 to E15 Fuel

End of Test Teardown and Inspection

As was the case for the other engine families, the main areas of focus during teardown were looking for signs of wear and also material compatibility issues. Visual inspection of the components of the 2 engines did not suggest significant differences between them (aside from the rod bearing failure). In particular, the bore finish, carbon deposits, bearings from the small and big end of the rod, and main bearings were inspected for signs of mechanical or thermal distress and accelerated wear. No significant differences were noted aside from slight differences in the appearance of the wrist pins, as shown in Figure 50.

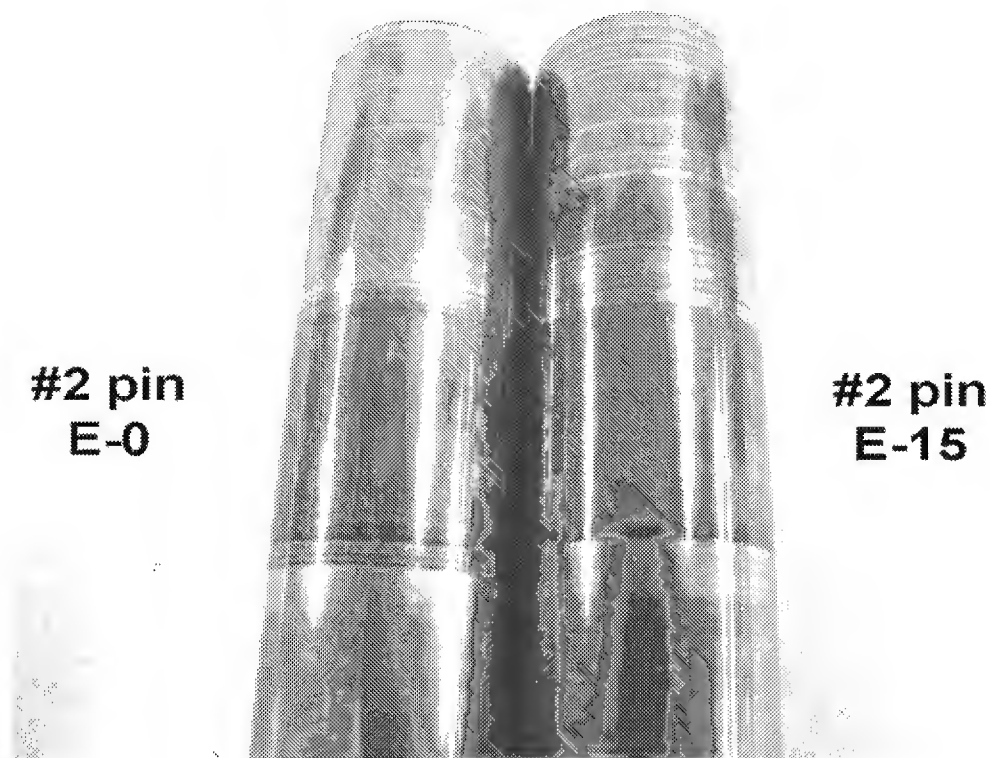


Figure 50: Cylinder 2 Wrist Pin Comparison, E0 on Left, E15 on Right

To provide a more in-depth analysis, selected components were further inspected. Using the same techniques as applied to the 9.9HP four-stroke components, the pistons and wrist pins from cylinder 2 on the 200HP EFI two-stroke engines were checked for material hardness. The results can be seen in Table 5. There were no significant differences in the hardness between the wrist pins, but there was a slight difference in hardness of the pistons (6.3%). The lower hardness of the piston on the E15 engine suggested it may have been running at higher temperatures. The nature of two-stroke engines causes them to be very sensitive to piston fit/piston temperature. An increase in piston temperature caused by fuel differences could cause increased propensity for power cylinder failures for customers. The slight difference in hardness was near the limit of repeatability for the test method so the results should be considered an indicator only. More testing would be necessary to gain confidence with a statistically significant sample size.

Table 5: Hardness Measurements on Various 200HP EFI Two-Stroke Engine Components

2.5L 200HP EFI	Hardness Scale	E0 1B860010	E15 1B810061	Percent Difference
Piston Wrist Pin, Cyl 2	Rc	54.7	54.1	1.1%
Piston Crown, Cyl 2	BHN	63.0	59.0	6.3%

In addition, the high pressure fuel pumps from both engines were sent to the pump manufacturer for flow testing. There were no significant differences in pump output between the 2 pumps, and they were within expected flow ranges for end of life components.

Additional Testing

4.3L V6 Catalyzed Sterndrive Emissions Comparison

Since the E15 fuel and a catalyzed engine were both readily available in the test lab, additional testing was performed beyond the test program requirements. Emissions tests were performed on E0-EEE fuel and E15 test fuel to determine any immediate impacts of increased ethanol for this engine family. No durability testing was performed. The 4.3L V6 sterndrive engine (General Motors V6 that was adapted and modified for marine use) was equipped with closed-loop electronic fuel injection and exhaust catalysts. The standard calibration for this engine in Mode 1 operation (rated speed and power) was such that the engine ran rich of stoichiometric to control exhaust gas temperatures. This is a common engine control approach to protect components during high power operation. For the type of exhaust gas oxygen sensor used on this engine, rich operation allows for no feedback control of the fuel air mixture. As such, the engine ran open-loop at Mode 1. All other modes ran closed-loop. The 5 mode HC+NOx and CO emissions totals were lower on E15 fuel due to the fact that the engine ran approximately 4.5% leaner on the E15 fuel at Mode 1. The HC+NOx at Mode 1 changed from 1.18 g/kw-hr on EEE to 1.10 g/kw-hr on E15. This small reduction was driven by the reduction of HC emissions. The NOx emissions increased on E15, but not as much as the HC decreased, yielding an overall lower total. The CO at Mode 1 was reduced from 45.6 g/kw-hr on EEE to 29.8 g/kw-hr on E15. The reduction of CO was attributed to the leaner operation at Mode 1. The HC+NOx and CO values for the remainder of the mode points were essentially the same since the closed loop fuel control allowed the engine to run at the same equivalence ratio. See Figure 51 for details of the emissions outputs.

The leaner operation at wide open throttle (Mode 1) caused an increase in exhaust gas temperatures when operating on E15 fuel. The exhaust gas temperature increase across all 6 cylinders was approximately 20°C. The elevated EGT during WOT operation could cause valvetrain durability issues. The catalyst temperatures were approximately 32°C higher at Mode 1 with E15 fuel. This increase in catalyst temperature at WOT would likely cause more rapid deterioration of the catalyst system leading to higher exhaust emissions over the lifetime of the engine. The full impact of E15 on catalyst life would depend on the duty cycle of this engine in actual application. Typical duty cycles of marine engines include considerable amounts of time at WOT operation (open loop) so the catalyst temperature increase is of concern.

4.3L V6 Catalyst Sterndrive Emissions Comparison EEE vs. E15 Fuels

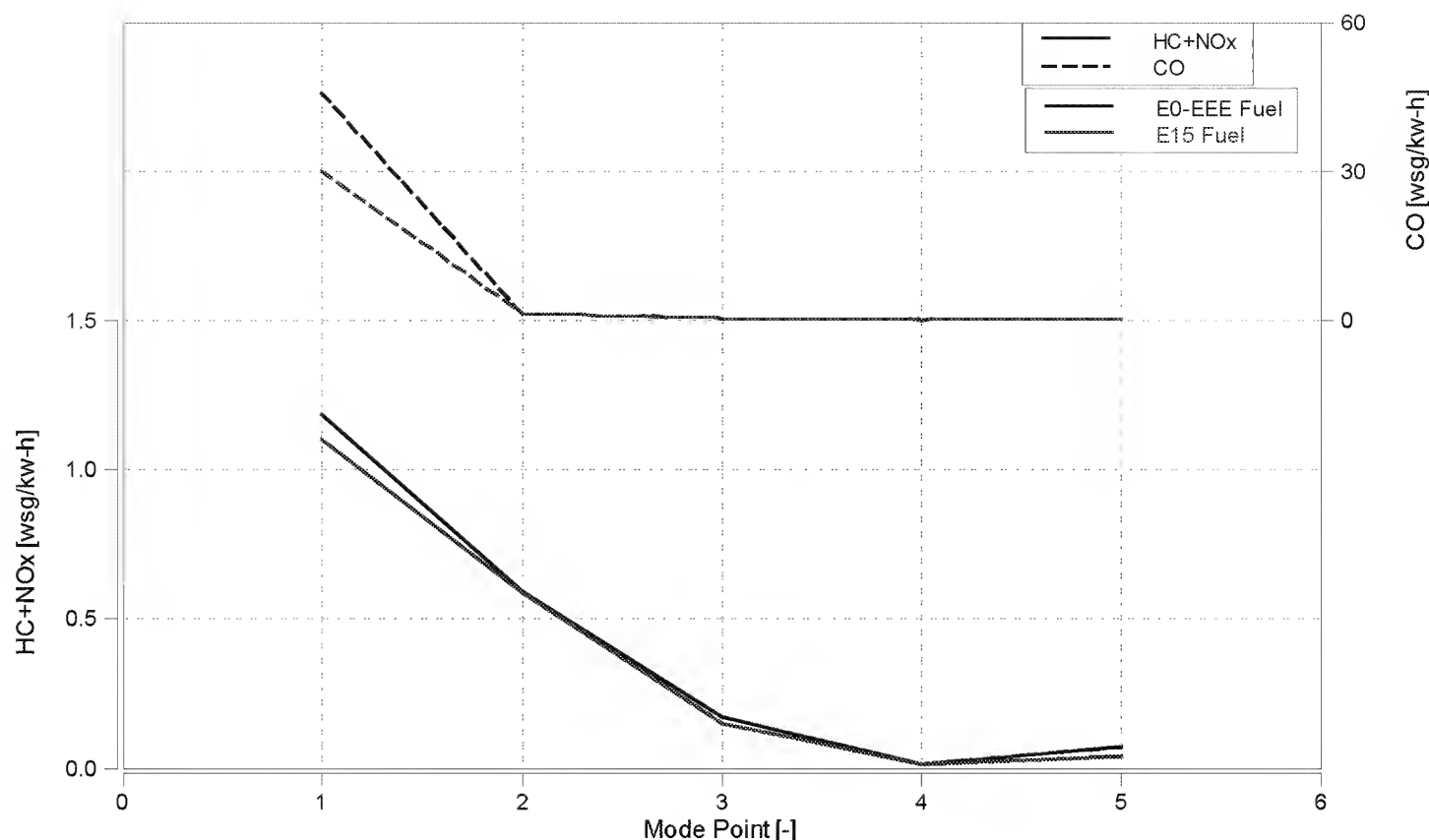


Figure 51: Emissions Comparison 4.3L V6 Catalyst Sterndrive, EEE vs. E15

The other aspect that was affected by running E15 on the closed-loop controlled engine was the fuel consumption. Since the closed-loop control system drove to an equivalence ratio, the fuel flow rate increased to account for the differences in fuel chemistry. Table 6 shows the fuel flow measurements by mode point along with the percent difference in fuel flow between the 2 fuels (positive values mean E15 fuel flow is higher). In closed-loop operation, the fuel flow increased 5.3% on average on E15 fuel. This increase in fuel flow causes concerns not just in fuel mileage, but also in useful range of the craft.

Table 6: Fuel Flow Comparison on 4.3L V6 Catalyst Sterndrive, EEE vs. E15

	EEE	E15	
Mode	Fuel Flow	Fuel Flow	Difference
	kg/hr	kg/hr	%
1	46.8	47.0	0.4%
2	24.2	25.5	5.3%
3	13.1	13.7	4.7%
4	7.1	7.5	5.2%
5	2.0	2.1	5.9%

Mode 2-4 Average 5.3%

Final Summary

Summary of Results:

EPA's recent announcement of a partial waiver approving E15 fuel for use in 2001 and newer cars and light trucks⁹ will create an opportunity for consumers to misfuel their marine engines. This program indicates that misfueling currently available marine outboard engines may cause a variety of issues for outboard engine owners. These issues included driveability, materials compatibility, increased emissions, and long-term durability. There were also 2 examples of how the ethanol fuel caused an increase in fuel consumption.

9.9HP Carbureted Four-Stroke:

The E15 engine showed high variability in HC emissions at idle during the emissions tests at the end of the 300 hour endurance period. Both the E0 control engine and E15 test engine ran leaner at idle and low speed at the end of the endurance test. When operated on E15 fuel after 300 hours of endurance, the lean operation at idle coupled with the additional enleanment from the E15 fuel caused the engine to exhibit misfire and poor run quality (intermittent misfire or partial combustion events). A misfiring engine would cause customer dissatisfaction due to the inability to idle the engine properly, excessive shaking, and hesitation or possibly stalling upon acceleration. As it relates to this study, the misfire caused an increase in HC emissions at idle. This increase in HC variability at idle caused the average total HC+NOx to increase from the start to end of endurance, whereas the HC+NOx on E0 fuel on both engines showed a decreasing trend. As expected, the CO emissions were reduced when using E15 fuel due to the leaner operation.

The power and torque output of the E15 engine was higher with E15 fuel than with E0 fuel. The power and torque output of the E0 control engine increased slightly with more endurance time. The power and torque output of the E15 test engine showed a flat or declining trend with more endurance time.

The end of test inspection showed evidence of elevated temperatures on base engine components due to the lean running on E15 fuel. There were significantly more carbon deposits on several components of the E15 engine, indicating that these parts likely had higher metal temperatures during operation. Hardness measurements indicated that the pistons had higher operating temperatures on the E15 engine. The exhaust gas temperature increased 17°C at wide open throttle as a result of the leaner operation on E15 fuel.

The fuel pump gasket on the E15 engine also showed signs of deterioration compared with the E0 engine after approximately 2 months of exposure to E15 fuel.

300HP Four-Stroke Supercharged Verado:

The E15 Verado failed 3 exhaust valves prior to completion of the endurance test. One valve completely failed and 2 others had developed significant cracks. Metallurgical analysis showed that the valves developed high cycle fatigue cracks due to excessive metal temperatures. The majority of exhaust valves on the E15 engine lost a significant amount of lash which may have contributed to the observed valve failures. The exhaust gas temperature increased 25-30°C at wide open throttle due to the lean operation with E15 fuel.

In addition to the elevated temperatures on the exhaust valves, the pistons showed evidence of higher operating temperatures. The carbon deposit differences indicated that the E15 engine's pistons were hotter during operation.

The E15 Verado generated HC+NOx values in excess of the Family Emissions Limit when operated on E15 fuel, but did not exceed the limit when operated on E0-E0. The primary contributor to the increase in exhaust emissions was the NOx due to enleanment caused by the oxygenated fuel. The CO emissions were reduced when using E15 fuel due to the leaner operation, as expected.

At emissions mode point 3, the lean combustion due to the E15 fuel caused the engine to lose torque output due to operation significantly leaner than LBT. As a result of the torque loss, the throttle input had to be increased 10% to maintain the same torque output as on E0-E0 fuel. The change in throttle input caused an increase in fuel flow of 10%. Mode 3 is representative of a typical cruising speed and load. The E15 fuel would cause the fuel consumption to be 10% higher at that operating point for a customer.

200HP EFI 2.5L Two-Stroke:

The 200HP EFI two-stroke engine showed no signs of exhaust emissions deterioration, though the emissions output after the full endurance testing was not measured due to a failure of the E15 engine. The primary driver of the HC+NO_x emissions on this engine family was HC (approximately 98% of the HC+NO_x total). As expected, since the E15 fuel caused the engine to run lean, the HC emissions were lower, as were the CO emissions. There was more variability of HC+NO_x observed on the E0 engine than the change in emissions on the E15 engine. The deterioration of the CO emissions had similar trends between the 2 engines.

The endurance test of the E15 engine was stopped short of the 300 hour target due to a connecting rod bearing failure on cylinder 3. The root cause of the bearing failure could not be identified. More testing is necessary to understand the effects of ethanol on two-stroke engine lubrication mechanisms where the oil and fuel move together through the crankcase. The E0 engine completed the entire 300 hours of durability testing.

Other than the bearing failure, the end of test teardown and inspection did not show any visible significant difference between the 2 engines. Hardness checks performed on the pistons of both engines indicate that the E15 engine may have had higher piston temperatures, a concern on two-stroke engines where higher temperatures could lead to more power cylinder failures. The exhaust gas temperature increased 15-20°C on average due to the lean operation with E15 fuel.

4.3L V6 EFI Four-Stroke Catalyzed Sterndrive

Since E15 fuel was readily available in the test facility and an engine equipped with exhaust catalysts was on the dynamometer, emissions tests were conducted on a 4.3L V6 sterndrive engine. No durability testing was performed. At rated speed and wide open throttle the exhaust gas temperatures increased by 20°C on average and the catalyst temperatures increased by 30°C. This increase in catalyst temperature would likely cause more rapid aging and deterioration of the catalyst system at WOT. The overall effect of the increase in deterioration rate would be duty cycle dependent. The HC and CO values decreased at the Mode 1 (rated speed, rated power) emissions test point, which is an open loop operating point, due to leaner operation with E15 fuel, as expected. The fuel consumption increased by 4.5% at the operating points that were running in closed-loop fuel control.

Recommendations:

This test program was limited in scope in terms of operating conditions. More investigation is necessary to understand the effects over a broader range of conditions. Ethanol's effects on part load operation, cold start, hot restart/vapor lock, and overall driveability need to be evaluated. The wide range of technology available for marine engines due to the wide range of engine size will complicate this issue significantly. Mercury Marine produces engines from 2.5HP-1350HP with a wide array of technologies ranging from two-stroke or four-stroke; carbureted, EFI, or direct fuel injected; naturally aspirated, supercharged, or turbocharged; and more.

Ethanol's ability to absorb water into the fuel is of paramount concern for the marine market and this issue has not been addressed in this test program. The contaminants that water can bring with it, potentially saltwater, can cause severe corrosion in fuel systems. A leak or fuel system failure could cause the engine to be inoperable and leave the vessel stranded, which would obviously be a major dissatisfaction to the customer. In addition, a better understanding of the effects higher ethanol blends have on marine fuel systems in terms of materials compatibility and corrosion is needed. Marine vessels tend to have very long storage durations, can be stored in very humid environments, and will have more opportunities to have fuel system exposure to water, including saltwater.

More testing is needed to understand how ethanol blends affect oil dispersion in two-stroke engines that have fuel and oil moving through the crankcase together. Ethanol tends to be a good solvent and may break down lubrication at critical interfaces by cleansing these surfaces of the residual oil film.

References:

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3. ASTM Standard D86, 2010a, "Standard Test Method for Distillation of Petroleum Products at Atmospheric Pressure," ASTM International, West Conshohocken, PA, 2010, DOI: 10.1520/D0086-10A, www.astm.org.
4. ASTM Standard D2699, 2010, "Standard Test Method for Research Octane Number of Spark Ignition Engine Fuel," ASTM International, West Conshohocken, PA, 2010, DOI: 10.1520/D2699-10, www.astm.org.
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8. Y. Wang, *Introduction to Engine Valvetrains*, Copyright 2007: SAE International, Warrendale, PA. P. 553
9. "EPA Announces E15 Partial Waiver Decision." United States Environmental Protection Agency, Office of Transportation and Air Quality, EPA-420-F-11-003, January 2011.

Appointment

From: Chen, Sue (ENRD) [Sue.Chen@usdoj.gov]
Sent: 9/21/2018 2:00:16 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Accepted: FW: Meeting: Truck Trailer Manufacturers Association
Location: 5415 WJCN + Conference Line Conference Line/Code / Ex. 6
Start: 9/21/2018 3:00:00 PM
End: 9/21/2018 3:45:00 PM
Show Time As: Busy

Recurrence: (none)

Message

From: Williams, Brendan [Brendan.Williams@pbfenergy.com]
Sent: 9/14/2018 4:43:14 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: FW: Barletta & Scott Irwin (I know, now you're interested!)
Attachments: 9.14.18 PA Refinery Letter to President Trump.pdf

Hey Mandy! Good seeing you earlier. Thank you for the time and please send my thanks to Bill and Andrew as well.

I thought you would be interested in the piece linked in the note I sent to Francis below, as well as the attached. Here's a quote from the Irwin piece that sums it all up:

"There is widespread interest in whether small refinery exemptions (SREs) under the RFS have "destroyed" demand for ethanol in the physical market. It seems obvious that this would be the case since SREs have the effect of waiving more than a billion gallons of the conventional ethanol mandate under the RFS. However, analysis of data on ethanol and gasoline consumption in the U.S. shows there is little if any evidence that the blend rate for ethanol has been reduced by SREs."

Also, while he suggests there could be some impact on E15, the facts available indicate that E15 sales are also thriving in the current environment, even with the RVP waiver in place. See the blog post at the top of this link:

<http://www.fuelingusjobs.com/blog>

As always, please let me know if there are any questions. Thanks!

Brendan

From: Williams, Brendan
Sent: Friday, September 14, 2018 12:11 PM
To: Brooke, Francis J. EOP/WHO <Francis.J.Brooke@who.eop.gov>
Subject: Barletta & Scott Irwin (I know, now you're interested!)

Francis-

I hope all is well. I wanted to make sure you saw the attached letter from Representative Barletta and some of the other Pennsylvania Republicans.

Also, here is a piece from (of all people) Scott Irwin highlighting how there is NO demand destruction from SREs and falling RINs:

<https://farmdocdaily.illinois.edu/2018/09/small-refinery-exemptions-and-ethanol-demand-destruction.html>

As always, please let me know if you have any questions.

Regards,

Brendan Williams
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Congress of the United States
Washington, DC 20515

September 14, 2018

President Donald J. Trump
1600 Pennsylvania Ave NW
Washington, DC 20500

Dear Mr. President:

We write to you today as Members of Congress representing the Commonwealth of Pennsylvania who are concerned about the negative impact the renewable fuel standard (RFS) is having on our constituents and the state's economy. We applaud the work your administration is doing to spur economic growth across the nation, and we believe that reforming the RFS in a manner that protects Pennsylvania refineries, which directly employ over 2,000 individuals, is entirely consistent with those efforts.

It is our understanding that you may be considering a policy change to allow for the sale of ethanol fuels during summertime months, despite environmental requirements under Clean Air Act. While reasonable minds differ on whether summertime E15 is a good idea, we strongly urge you to advance permanent reforms that address the harms the current approach to implementing the RFS inflicts upon refiners, particular if summertime restrictions are lifted for ethanol.

A robust refining sector is vital to blue-collar manufacturing jobs and America's energy security. Unfortunately, the RFS program has reduced refining capacity on the East Coast and has had a devastating financial impact on Pennsylvania refineries, recently forcing one of our state's refineries into bankruptcy and pushing another to seek investors. A new study that examined the economic effects of the RFS program on PADD 1 refiners found, "EPA's proposed 2019 RFS requirements have the potential to make a number of East Coast refineries unprofitable," which "will increase the probability that one or more of these refineries may be unable to continue production."¹

Reforms to the RFS should not only benefit the agribusiness giants of the Midwest. We believe fairness to Pennsylvania dictates adoption of policies that minimize the price of tradable RFS credits called Renewable Identification Numbers (RINs); continuation of the policy of addressing harms to our smaller refineries without making conditions worse for other sized refineries; and adoption of RIN market reforms to increase the liquidity of RINs, prevent hoarding, and eliminate speculation in the market. These policies can be adopted without any harm to the farmer or biofuel producer, as years of experience have shown that high RINs prices do not stimulate any additional biofuel blending. By contrast, low RINs prices in recent months have been met with record ethanol production and use.

Unemployment in Pennsylvania is down to 4.2 percent – the lowest point since 2007. By adopting a balanced approach to RFS reforms with permanent and durable relief for refiners, we

¹ Craig Pirrong, Analysis of the RFS Program and the 2019 Proposed Standards 2 (Aug. 17, 2018)

believe you will help our state continue this historic economic growth, while also creating a win-win solution for farmers and Pennsylvania refiners.

Thank you for your consideration of our request.

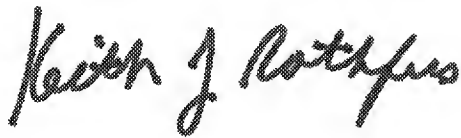
Sincerely,



Lou Barletta
Member of Congress



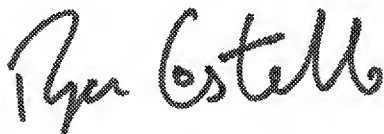
Bill Shuster
Member of Congress



Keith J. Rothfus
Member of Congress



Scott Perry
Member of Congress



Ryan A. Costello
Member of Congress

Message

From: Madan, Carolyn (Lee) [Carolyn_Madan@lee.senate.gov]
Sent: 1/28/2019 6:14:19 PM
To: Palich, Christian [palich.christian@epa.gov]
CC: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Re: RFS Questions

Thanks for connecting us!

Mandy, do you have any time to chat today?

My desk is Personal Phone / Ex. 6. Or let me know a good time/number to reach you.

Best,
Carolyn

From: "Palich, Christian" <palich.christian@epa.gov>
Date: Friday, January 25, 2019 at 10:36 AM
To: "Madan, Carolyn (Lee)" <Carolyn_Madan@lee.senate.gov>
Cc: "Gunasekara, Mandy" <Gunasekara.Mandy@epa.gov>
Subject: RFS Questions

Hi Carolyn,

It was great to chat with you the other day. As promised I am CCing Mandy from our Air Office who knows everything RFS.

Mandy, Carolyn had a couple questions about the issue prior to the Administrator and Senator Lee's meeting on Tuesday if you have a couple minutes to chat.

Hope you both have a terrific day!

Christian R. Palich
Deputy Associate Administrator
Office of Congressional & Intergovernmental Affairs
U.S Environmental Protection Agency
O: 202.564.4944
C: 202.306.4656
E: Palich.Christian@epa.gov

Message

From: Jack Barrow [jack.barrow@btr.energy]
Sent: 9/28/2018 3:29:11 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Thank you!

Mandy -- thank you for the time and feedback on Tuesday. Really appreciate it. We'll keep you apprised as we engage with the White House.

Please let me know if you have any luck with Acting Administrator Wheeler and his team. If you think it might be helpful, I'm sure Anna Wildeman would support our efforts; you could coordinate with her.

Thanks again.

Best,
Jack

--

Jack Barrow
Co-Founder | BTR Energy
(952) 380-7512

Message

From: Jack Barrow [jack.barrow@btr.energy]
Sent: 9/11/2018 1:33:08 PM
To: Wehrum, Bill [Wehrum.Bill@epa.gov]; Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
CC: Dominguez, Alexander [dominguez.alexander@epa.gov]
Subject: Re: BTR Energy update?
Attachments: BTR Application 1 pg Summary.pdf; 8.17.18 Letter to President Trump.pdf

Bill, Mandy, Alex -- I hope you're all doing well! I'm looking forward to catching up in a few weeks, Mandy. Just thought I'd share two quick updates and some documents we can discuss when we meet.

First, BTR has added three new major auto OEMs to our coalition, **Toyota, Honda, and Daimler**. I will share a joint letter from those three, along with Hyundai, that endorses our application later this week.

Altogether, the following OEMs already have contractual obligations with us to participate in the pathway and/or have directly endorsed BTR to the Agency and on the Hill (as you can see from the summary I've attached): General Motors, BMW, Toyota, Honda, Daimler, Hyundai, Nissan, Fiat-Chrysler, BYD Motors, and more.

That means that through one single administrative action -- approving BTR's application -- EPA can bring a significant portion of the electric pathway online, good news for the farmers that work with us, a few of whom you've met. We also know that approval of our application *does not conflict* with the approval of other vehicle-telematics based applications, like the one submitted by Waste Management.

And second, as I'm sure you know, the biogas and biomass trade associations organized a letter with more than 100 organizations to Acting Admin. Wheeler, much like our letter to President Trump from a group of more than 60 farmers and digester operators, which I sent previously (reattached for reference).

Looking forward to reconnecting.

Best,
 Jack

On Mon, Aug 27, 2018 at 11:30 AM, Jack Barrow <jack.barrow@btr.energy> wrote:

Bill, Mandy -- I hope this email finds you both well. Congratulations on the announcement last week! Lots of exciting progress from EPA recently.

Just wanted to send you both a quick note to check-in. I haven't heard from anyone at the Agency since we met with former Administrator Pruitt in late June; any update on a plan to follow through on his decision regarding our application? I know you've been extremely busy, and that leadership changes always cause hiccups, but figured I should ask.

On our end, there's a few developments to report. First, several of our champions on the Hill sent the attached letter to Acting Administrator Wheeler a few weeks ago, and we've submitted a request to meet with him.

In addition, we've just coordinated and sent a letter to President Trump (also attached), which was endorsed by more than 60 family farmers and digester operators that could immediately benefit from implementing the electric pathway. Many of those operators are our partners and will participate through BTR's platform. And since we last met, we've engaged several additional auto OEMs, including Toyota, Daimler, and Honda, all of which are interested in the program and how their telematics data could enable it to support US agriculture.

That's all from me. Thanks for all your help, and I look forward to hearing from you soon.

Best,
Jack

--

Jack Barrow
Co-Founder | BTR Energy
(952) 380-7512

--

Jack Barrow
Co-Founder | BTR Energy
(952) 380-7512

August 17, 2018

The Honorable Donald J. Trump
President of the United States
The White House
1600 Pennsylvania Avenue, N.W.
Washington, D.C. 20500

Make America Great Again

Dear Mr. President:

We write concerning a matter of significant national importance involving an existing component of the Renewable Fuel Standard ("RFS") program - the Electric Pathway - that has been held up at the Environmental Protection Agency for far too long.

Two dozen members of the U.S. House of Representatives from nine states have written to EPA urging the Agency to act on this opportunity. In addition, both chambers of Congress have passed Fiscal Year 2019 Interior Appropriations bill reports that encourage the Agency to act on the Electric Pathway. Family farmers from across America have testified at two EPA hearings over the past year, and have continuously engaged with the Agency directly since you took office. And yet, we still need your help. EPA has advised us that activating the Electric Pathway and helping farmers and rural communities is still not a priority, despite the goals you have set for your Administration.

As background, we collect and use biogas produced from manure, wastewater, food waste and other types of organic waste that is processed in anaerobic digester (AD) systems located at farms, community waste and wastewater treatment plants, and other facilities across the United States. The biogas is used to produce heat and generate electricity, some or all of which is sold onto the electric grid. Already in 2014, the EPA finalized regulations approving electricity produced this way as a cellulosic or advanced biofuel under the RFS program, and established a corresponding RFS fuel pathway -- the Electric Pathway.

Unfortunately, though the Pathway is in place and we are already producing electricity, we have not yet been able to participate because the Agency refuses to approve applications to do so. For four years, we have watched as other cellulosic and advanced biofuel producers benefit from the RFS program, while we have had to wait for EPA to enable us to do the same. The forgone revenues for our facilities are significant and have continued to grow, at the same time EPA has repeatedly acknowledged that significant shortages of cellulosic and advanced biofuels cause problematic market dynamics in the RFS program.

AD facilities are an innovative industry best practice, particularly in dairy and livestock agriculture. There is no other type of energy production - domestic or foreign, fossil or

renewable - that produces as many economic and environmental benefits for farmers and their rural communities. **One AD facility** can provide a farm with heat and renewable, base load electricity for its own needs, as well as additional revenue from the sale of electricity. An AD also helps a farm manage manure, protect water resources, reduce ammonia and hydrogen sulfide emissions associated with livestock production, minimize or eliminate harmful pathogens such as e.coli, divert organic waste streams from landfills, produce beneficial and valuable sources of nutrients and organic matter for crops, and create attainable STEM jobs and support rural development.

These benefits could be multiplied many times over with your intervention. About 250 dairy and livestock farms generate electricity with an AD today, where the positive impacts of the Electric Pathway will first be felt. The Department of Agriculture estimates that another 9,000 farms could build an AD given the right incentives, and thousands more could be built at wastewater treatment plants and waste processing facilities.

But AD facilities - and all the benefits and jobs they create - depend in large part on revenue from electricity sales, and in many cases that revenue has plummeted. That is why programmatic certainty and our participation in the RFS program is so important: the RFS Electric Pathway would provide access to an additional revenue stream for many farms and other facilities that operate AD systems, and it would encourage many more to build them.

Mr. President, your intervention is needed to sustain existing rural jobs and create thousands more. EPA action will mean we can finally receive credit for supplying RFS-approved biogas electricity to our nation's electric vehicle fleet. That is why we respectfully request your help to ensure that EPA acts on this matter this year. Please direct Acting Administrator Wheeler to follow through on your promise to America's rural communities, make the Electric Pathway a priority, and get it done.

Sincerely,

(The endorsers below are the owners and/or operators of the farms and/or AD facilities listed.)

Wisconsin

*John Jacobs, Green Valley Dairy, **Krakow, WI***

*Debbie Crave, Crave Brothers Farm and Farmstead Cheese, (Dairy) **Waterloo, WI***

*Jeff Rich, GL Dairy Biogas Project, (Gundersen Health System) **Middleton, WI***

*Jeff Rich, Sunnyside Digester, (Gundersen Health System) **Sun Prairie, WI***

*John Haeckel / Jessica Niekrasz, Clean Fuel Partners, (Dairy) **Dane, WI***

*Barry Bassett, Green Whey Energy, (Community Digester) **Turtle Lake, WI***

*Cody Heller, Heller Farms / Cow Poo (Dairy) **Alma Center, WI***

*Dr. Bob Nagel, Holsum Elm Dairy (Dairy) **Hilbert, WI***

*Dr. Bob Nagel, Holsum Irish Dairy (Dairy) **Hilbert, WI***

*JJ Pagel, Pagel's Ponderosa Dairy, (Dairy) **Kewaunee, WI***

*Josh Meissner, Norm-e-Lane Farms, **Chili, WI***

Lee Jenson, Five Star Dairy Farm, (Dairy) Elk Mound, WI
Dave Hischke, Sunrise Dairy, Suring, WI

Washington

Ben Hansen, Farm Power Lynden, (Dairy) Lynden, WA
Ben Hansen, Farm Power Rexville, (Dairy) Mount Vernon, WA
Ben Hansen, Ranier Biogas, (Dairy) Enumclaw, WA
Srirup Kumar, Ballard AD-25, (Food Waste), Seattle, WA
Tim Murphy, Bainbridge AD-25, (Food Waste), Bainbridge Island, WA

Virginia

Roy VanDerHyde, VanDerHyde Dairy (Dairy) Chatham, VA

Vermont

Ronald Hill, Four Hills Farm, Bristol, VT

Pennsylvania

Brett Reinford, Reinford Farms, (Dairy) Mifflintown, PA
Richard Crone, Pine Hurst Acres, Danville, PA
Gerald Zimmerman, Oak Hill Farm, Nottingham, PA
Andrea Sensenig, Compass Farms, (Dairy) Kirkwood, PA

Oregon

Ben Hansen, Farm Power Misty Meadow, Tillamook, OR
Ben Hansen, Farm Power Tillamook, Tillamook, OR

Ohio

Trent Stoller, GreenTop Acres, (Dairy) Haviland, OH
Mel Kurtz, Collinwood Bioenergy, (Community Digester) Cleveland, OH
Mel Kurtz, Three Creek Bioenergy, (Municipal WWTP) Sheffield Village, OH
Mel Kurtz, Central Ohio Bioenergy, (Community Digester) Columbus, OH
Mel Kurtz, Wooster Water Pollution Control Plant, (Municipal WWTP) Wooster, OH
Mel Kurtz, Lime Lakes Energy, Norton, OH
Mel Kurtz, Three Creek Bioenergy, North Ridgeville, OH
Mel Kurtz, Buckeye Biogas, Wooster, OH
Mel Kurtz, Zanesville Energy, (Community Digester) Zanesville, OH
Mel Kurtz, Ringler Energy, Ashley, OH

New York

Marianne Robinson, Sunnyside Farms, (Dairy) Scipio Center, NY
Jigar Shah, Niagara Bioenergy, (Community Digester) Wheatfield, NY
Jigar Shah, Buffalo Bioenergy, (Community Digester) West Seneca, NY
Jigar Shah, Cayuga County Regional Digester, Auburn, NY
Jason Burroughs, Aurora Ridge Dairy, LLC (Dairy) Aurora, NY

Jon and Connie Patterson, Patterson Farms (Elm Road Dairy) Auburn, NY
Christopher Noble, Noblehurst Farms, (Dairy) York, NY
Hans Boxler, Jr., Boxler Dairy Farms, Varysburg, NY

Michigan

Michael Geerlings, Geerlings Hillside Farms, (Swine) Overisel, MI
Andy Austin, Brook View Dairy, (Dairy) Freeport, MI
Mark Lucas, Scenic View Dairy, (Dairy) Fennville, MI
Jigar Shah, Fremont Regional Digester, (Community Digester) Fremont, MI

Iowa

Bryan Sievers, Sievers Family Farms, (Beef Cattle) Stockton, IA
John McGrath, Amana Farms, (Beef Cattle) Amana, IA

Indiana

Ryan Rogers, Homestead Dairy, Plymouth IN

Connecticut

Brian Paganini, Quantum BioPower, (Community Digester) Southington, CT

California

Daryl Maas, Maas Energy Works, Open Sky Ranch, Riverdale, CA
Daryl Maas, Maas Energy Works, Van Steyn Dairy, Elk Grove, CA
Daryl Maas, Maas Energy Works, Van Warmerdam Dairy, Galt, CA
Daryl Maas, Maas Energy Works, GJ TeVelde Ranch, Tipton, CA
Daryl Maas, Maas Energy Works, Pacific Rim Dairy, Corcoran, CA

CC:The Honorable Andrew Wheeler
Acting Administrator
Environmental Protection Agency
1200 Pennsylvania Avenue NW
Washington, D.C., 20460

Cc: The Honorable Sonny Perdue
Secretary
U.S.Department of Agriculture
1400 Independence Ave., S.W.
Washington, DC 20250



The Electric Pathway

In 2014, EPA promulgated regulations that enable farms and other facilities that generate electricity with biogas to participate in the RFS “electric pathway,” wherein the electricity those farms produce is connected to use in electric vehicles. These farms may then benefit from the creation and sale of electric-RINs.

As a company and an applicant, BTR Energy is unique in its focus on agricultural digesters. BTR Energy is also capable of bringing a significant share of the electric vehicle market to bear.

BTR’s Industry Partners

- BTR works with more than 50 digester operators, primarily dairy farms in Wisconsin, Michigan, Pennsylvania, Ohio, New York, California, and Washington (letter attached).
- National Milk Producers Federation strongly advocates for activation of the pathway (letter attached).
- BTR works with the following auto-manufacturers: **General Motors, Fiat-Chrysler, Toyota, Nissan, Hyundai, BMW, Honda, Daimler, BYD Motors, Workhorse Trucks, and more.**

Congressional Support

- Language adopted in the report sections of both the Senate and House FY19 Interior Appropriations bills: ***“Electric Pathway – The Committee notes the backlog of applications under the Renewable Fuels Pathway II rule finalized in 2014. No applications for the electric pathway – which could help support rural agricultural communities – have been approved since the rule went into effect. The Committee strongly encourages the Agency to take action on the existing applications within 90 days of the enactment of this Act.”***
- Three letters with 24 bipartisan members from the US House of Reps, most recently to Acting Administrator Wheeler from Congressman Mike Gallagher (R-WI), Congresswoman Marcy Kaptur (D-OH).
- Questions for the record submitted by Congressmen David Joyce (R-OH) and Derek Kilmer (D-WA) and Congresswoman Marcy Kaptur (D-OH).
- Calls made by Congressmen Chris Collins (R-NY) and Mike Gallagher (R-WI), along with staff for Senator Shelby.

Positive Reaction from Obligated Parties

- **Shell:** “In general, we support the inclusion of electricity ... in the program. We believe inclusion of such renewable fuels is consistent with the intent of the law” (public response to 2016 REGS Rule).
- **BP:** “...we believe it would strengthen the RFS program if additional renewable sources were considered eligible to generate RINs” (public response to 2016 REGS Rule).

BTR Energy Statutory Analysis

- In the preamble of the proposed 2016 REGS rule, EPA stated clearly it was seeking input on the approach to RIN generation for renewable electricity that would best further the goals of the RFS program but was not proposing a preferred approach. EPA also stated clearly it was seeking comment on how best to implement and/or revise the RFS regulations pertaining to the generation of RINs for renewable electricity but was not proposing changes to those regulations.
- Because no “e-RIN” regulatory amendments were included in the proposed 2016 REGS rule, EPA may implement its existing regulations, as finalized on July 18, 2014. Those regulations provide flexibility in approving applications: **“EPA believes an appropriate approach at this time is to examine [e-RIN] registrations on a case by case basis, and to learn from this experience.”** And **“EPA and stakeholders will benefit from experience in implementing the current regulatory provisions before adopting significant modifications.”**¹ This clearly indicates that EPA can and should implement its existing regulations and simply issue guidance where necessary.

¹ “Regulation of Fuels and Fuel Additives.” US Environmental Protection Agency, July 18, 2014.
<https://www.gpo.gov/fdsys/pkg/FR-2014-07-18/pdf/2014-16413.pdf>

Message

From: Nolan, Rich [RNolan@nma.org]
Sent: 10/4/2018 7:22:55 PM
To: Dominguez, Alexander [dominguez.alexander@epa.gov]
CC: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: RE: Hi Mandy!

Alex, thanks but I no longer need to connect. Have a great day.

From: Dominguez, Alexander <dominguez.alexander@epa.gov>
Sent: Thursday, October 4, 2018 3:20 PM
To: Nolan, Rich <RNolan@nma.org>
Cc: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Subject: RE: Hi Mandy!

Rich – Could you do tomorrow at 10:00 or 11:15? If so, is (202) 463-3241 the best number to reach you at?

Alex

From: Nolan, Rich [mailto:RNolan@nma.org]
Sent: Thursday, October 4, 2018 3:01 PM
To: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Cc: Dominguez, Alexander <dominguez.alexander@epa.gov>
Subject: RE: Hi Mandy!

Hi Mandy, might you have 5 minutes for a short call on Uranium later today or Friday? Will be quick and can work around your schedule. Thanks! Rich



Rich Nolan
 Senior Vice President, Government and Political Affairs
 National Mining Association
 101 Constitution Ave. NW, Suite 500 East
 Washington, D.C. 20001
 Phone: (202) 463-2600
 Direct: (202) 463-3241
rnolan@nma.org

From: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Sent: Monday, June 12, 2017 10:36 AM
To: Nolan, Rich <RNolan@nma.org>
Cc: Dominguez, Alexander <dominguez.alexander@epa.gov>
Subject: Re: Hi Mandy!

I'm on my way back from Italy, but am available later this week. Alex, can you set something up please?
 Rich, look forward to connecting soon.

Sent from my iPhone

On Jun 12, 2017, at 4:16 PM, Nolan, Rich <RNolan@nma.org> wrote:

I would love to catch up if you have a minute this week and are in DC. Rich

Rich Nolan
NMA

Message

From: Congressman Paul Gosar [Rep.Paul.Gosar@mail.house.gov]
Sent: 1/26/2019 12:42:58 AM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Border Tour: We need a wall. We Need it now!



We need a wall. We Need it now!



This weekend, I joined eight other members of Congress at our Southern Border in Arizona for a two day border tour. We spoke with border patrol agents, ranchers and law enforcement officials. During our tour we heard first hand the destruction and dangers that comes with open borders and loopholes in our immigration laws.



Ranchers shared stories about the day to day reality of illegal aliens using their land as drug and human trafficking routes. They walked us through how these criminal organizations use our open borders and their land to make billions.

We also spoke with Border Patrol agents who shared stories detailing the changes they have seen in the past couple of years. They noted that one of the biggest changes they are seeing is the shift in the illegals aliens attitude. Instead of fleeing they are fighting. Illegal aliens have become emboldened by the advocacy of open borders the democrats have promoted.

- Over the last five years, we have seen a 2,000% increase in asylum claims
- We have seen a 50 percent rise in family units coming to our southern border
- 98 percent of these family units will stay in our country.
- In the El Paso, Rio Grande Valley, Tucson, and Yuma Sectors over the last four months, smugglers and traffickers have delivered 53 large groups, totaling 8,797 illegal aliens.



This isn't just lawmakers in Washington saying we have a crisis at our southern border. This is people who live the reality of it every day. These are the ranchers and individuals whose livelihood has been taken from them because open border advocates have chosen to protect illegal aliens instead of the citizens they represent.

Republicans have taken action and provided a solution. Democrats have not. Ignoring this crisis diminishes the Americans and migrants who have fallen victim to the crimes committed by illegal aliens, or are harmed because of illegal drugs flowing across the border.

Our job is to protect our own citizens. Our country. The President's proposal echoes the very need border patrol agents tell us first hand they need. We need a wall and we need it now.



No real American citizen should live in fear that they will be killed by a criminal illegal alien. This problem is 100 percent preventable. Our border patrol agents shouldn't be left begging our government for the proper tools to stop illegal criminal aliens, drug smugglers, sex traffickers and bad hombres.

We can do better. We have to do better.

It's time for Speaker Nancy Pelosi to come to the table and put the needs of the American people first.



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Message

From: Williams, Brendan [Brendan.Williams@pbfenergy.com]
Sent: 9/5/2018 4:46:25 PM
To: Dominguez, Alexander [dominguez.alexander@epa.gov]
CC: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: RE: Catching Up

Great. That time frame actually works perfect, as I should be at my desk during that whole range. Thanks!

B

From: Dominguez, Alexander [mailto:dominguez.alexander@epa.gov]
Sent: Wednesday, September 5, 2018 12:45 PM
To: Williams, Brendan <Brendan.Williams@pbfenergy.com>
Cc: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Subject: RE: Catching Up

EXTERNAL EMAIL: If unknown sender, Do Not click links/attachments. Never give out your user ID or password!

Hey Brendan – Mandy is going to try and call today between 2:00 – 4:00. If you have a preference on time let me know or if that doesn't work Friday at 4:00 is another option. Can also look at next week if necessary.

Appreciate it,
Alex

Sent from my iPhone

From: Williams, Brendan [mailto:Brendan.Williams@pbfenergy.com]
Sent: Wednesday, September 5, 2018 10:13 AM
To: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Cc: Dominguez, Alexander <dominguez.alexander@epa.gov>
Subject: Catching Up

Mandy-

I hope all is well. I wanted to see if you had any time to catch up this week. Please let me know if you have any time available at your earliest convenience and thanks in advance for your consideration.

Regards,

Brendan Williams
Government Relations
PBF Energy
601 Pennsylvania Avenue, NW
Suite 900 South
Washington, DC 20004
O: (202) 434-8254
M: (703) 863-6825
brendan.williams@pbfenergy.com
www.pbfenergy.com



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Message

From: Michael Pasko [mpasko@nmma.org]
Sent: 9/19/2018 8:27:05 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
CC: Woods, Clint [woods.clint@epa.gov]
Subject: Mtg. Request: Biobutanol Coalition
Attachments: Background Memo - EPA Biobutanol Mtg Request.pdf

Mandy—

I wanted to reach out to see if you would be able to meet with representatives from a newly formed “Biobutanol Coalition”. Coalition members are comprised of the recreational boating industry (both manufacturers and users) as well as renewable energy and biotechnology organizations, including:

- National Marine Manufacturers Association
- BoatUS
- Gevo
- SIGMA
- BIO

While EPA’s recent approval of biobutanol at 16.1 volume % for on-highway use was extremely positive, there are some regulatory impediments that we believe EPA can address to better get this fuel on the marketplace. Attached is a background memo that illustrates what we would like to discuss in a meeting.

Please let me know some dates and times that would be workable for you and I can convene the coalition.

Thanks so much.

-Mike

Michael R. Pasko
Director, Federal Government Affairs

National Marine Manufacturers Association
650 Massachusetts Avenue, NW Suite 520 | Washington, DC 20001
o. 202-737-9760 | nmma.org

Message

From: Joseph Mendelson [jmendelson@tesla.com]
Sent: 9/7/2018 7:05:57 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: FW: Tesla - Meeting Request on Vehicle Standards

Hi Mandy --

Personal Matters / Ex. 6

Per my saying we would like have an intro meeting with Administrator Wheeler, as you can see below Josh has been great in trying to help move it along. We welcome any additional help moving it forward from your end.

My best,
Joe

Joseph Mendelson | Senior Counsel | Policy and Business Development
1050 K Street, NW, Suite 101 | Washington, DC 20001
c 703.244.1724 | e jmendelson@tesla.com

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From: Lewis, Josh <Lewis.Josh@epa.gov>
Sent: Tuesday, August 28, 2018 4:06 PM
To: Joseph Mendelson <jmendelson@tesla.com>
Subject: RE: Tesla - Meeting Request on Vehicle Standards

Request is back with Aaron. Haven't heard from him one way or the other. Let me give it a few days and will email him again after the Monday holiday.

From: Joseph Mendelson [<mailto:jmendelson@tesla.com>]
Sent: Tuesday, August 28, 2018 11:40 AM
To: Lewis, Josh <Lewis.Josh@epa.gov>
Subject: RE: Tesla - Meeting Request on Vehicle Standards

Hi Josh,

I hope the summer wind down is treating you well. I just wanted to follow up on our phone call from two weeks ago. I wanted to see if there was an update on getting back into the queue to meet with Administrator Wheeler and/or if there is word back from Aaron Dickinson on this front. Please let me know.

Many thanks!
Joe

Joseph Mendelson | Senior Counsel | Policy and Business Development
1050 K Street, NW, Suite 101 | Washington, DC 20001
c 703.244.1724 | e jmendelson@tesla.com

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Please consider the environment before printing this email.

From: Lewis, Josh <Lewis.Josh@epa.gov>
Sent: Monday, August 13, 2018 10:01 AM
To: Joseph Mendelson <jmendelson@tesla.com>
Subject: RE: Tesla - Meeting Request on Vehicle Standards

564-2095.

I should be at my desk from now until noon, and then again from 3-4

Josh

From: Joseph Mendelson [<mailto:jmendelson@tesla.com>]
Sent: Friday, August 10, 2018 4:41 PM
To: Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Re: Tesla - Meeting Request on Vehicle Standards

Thanks, Josh. Please let me know the best time and number for us to touch base on Monday.

Have a good weekend!

Best,
Joe

On Aug 10, 2018, at 4:09 PM, Lewis, Josh <Lewis.Josh@epa.gov> wrote:

Hi Joe,

Hope you're well. Your meeting request – which I think started w/ an email you sent to Mandy and others – has come full circle back to the air office (the Administrator's office asked that we take it on his behalf).

Probably worth catching up by phone on Monday to discuss, as I know you've been in pretty recently to meet with both Bill and Mandy. I'm around Monday morning, except 9:30-10

Josh Lewis
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 564 2095

<EPA Meeting Request Form Tesla - Acting Administrator Wheeler 7-23-18.docx>

Message

From: Jaber, Makram [mjaber@hunton.com]
Sent: 10/2/2018 2:35:48 PM
To: Tsirigotis, Peter [Tsirigotis.Peter@epa.gov]
CC: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Request for meeting on NSR proposal in ACE package
Attachments: UARG Comments on 2007 NSR Hourly Emissions Proposal-c.pdf; Upper Tolerance Limit Report -- Attachment to UARG Comments on 2007 NSR Hourly Emissions Proposal-c.pdf; SoCo Comments - NSR EGU Hrly Emiss Test 2007-08-08-c.pdf

Dear Peter,

On behalf of UARG, I request a meeting with you and appropriate staff regarding the details of the proposed emissions methodologies for the proposed maximum achieved hourly emissions test. We are requesting a face-to-face meeting at RTP, as soon as feasible, given the approaching comments deadline. The purpose of the meeting is to discuss our concerns regarding the proposed methodologies – in particular, the statistical methodology proposed as alternative 1 – and potential solutions to the problem. Our concerns were laid out at length in UARG's and Southern Company's comments on the 2007 proposal. I attach them for your convenience.

It may be useful to chat briefly on the phone to give you a bit more information, which could be helpful to you in determining which staff would make sense to attend from your point of view. Let me know what would be a good time for me to call you today, if at all possible.

Best Regards.

Makram Jaber

HUNTON
ANDREWS KURTH

Makram Jaber
Partner
mjaber@HuntonAK.com
p 202.955.1567
bio | vCard

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2200 Pennsylvania Avenue, NW
Washington, DC 20037

HuntonAK.com

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Chris M. Hobson
Senior Vice President
Research and
Environmental Affairs

600 North 18th Street
Birmingham, AL 35203
Tel 205.257.2812
Fax 205.257.7938



August 8, 2007

United States of America
Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, D.C. 20460

**COMMENTS OF SOUTHERN COMPANY ON SUPPLEMENTAL NOTICE
OF PROPOSED RULEMAKING FOR PREVENTION OF SIGNIFICANT
DETERIORATION AND NONATTAINMENT NEW SOURCE REVIEW:
EMISSION INCREASES FOR ELECTRIC GENERATING UNITS; 72 FED.
REG. 26,202 (MAY 8, 2007) (E-DOCKET NO. OAR-2005-0163)**

Electronic Submittal: <http://www.epa.gov/edocket>

Dear Sir or Madam:

Attached are the comments of Southern Company on the U.S. Environmental Protection Agency's (EPA) proposed emission test for electric generating units. We appreciate the opportunity to submit these comments and look forward to seeing these important issues resolved. These comments are in addition to and supportive of the comments submitted by the Utility Air Regulatory Group.

Southern Company believes this proposed rule is extremely important. This rule will make it clear that the electric utility industry can undertake needed projects to maintain and improve the safety, efficiency, and reliability of its facilities and ensure that electricity is available to the citizens of the United States. Our comments support EPA's preferred Option 1 that adds an hourly emissions rate test to the annual test already established under the existing NSR regulations. This combined approach will provide the most meaningful and comprehensive analysis of the

possible effect a project may have on a unit's emissions, while simultaneously simplifying and clarifying the NSR emissions analysis. Within Option 1, Southern Company supports the adoption of the NSPS maximum achievable hourly emissions rate test. Alternatively, Southern Company would support an input-based statistical approach if revised in accordance with the attached comment to address flaws inherent in the statistical approach as proposed.

Please call me or Dan Warren at 205-257-6947 if you have any questions.

Sincerely,

A handwritten signature in cursive script, reading "Chris M. Holsen". The signature is written in dark ink on a white background.

**BEFORE THE
UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY**

Supplemental Notice of Proposed Rulemaking for Prevention of Significant Deterioration and Nonattainment New Source Review: Emission Increases for Electric Generating Units

E-Docket No. OAR-2005-0163

**COMMENTS OF
SOUTHERN COMPANY**

SOUTHERN COMPANY
30 Ivan Allen Jr. Boulevard, NW
Atlanta, Georgia 30308
(404) 506-0805

August 8, 2007

**Supplemental Notice of Proposed Rulemaking for
Prevention of Significant Deterioration and Nonattainment New Source Review:
Emission Increases for Electric Generating Units
72 Fed. Reg. 26,202 (May 8, 2007)**

Written Comments of Southern Company

I. Introduction

On May 8, 2007, the Environmental Protection Agency published a Supplemental Notice of Proposed Rulemaking (“SNPR”) ”recasting” its 2005 proposal to adopt an hourly emissions rate test for determining whether New Source Review (“NSR”) applies to projects performed at electric generating units (“EGUs”). 72 Fed. Reg. 26,202 (May 8, 2007). The initial 2005 proposal introduced three options – a maximum achieved hourly emissions test, a maximum achievable hourly emissions test, and an output-based approach – but did not propose specific regulatory language. 70 Fed. Reg. 61,081 (Oct. 20, 2005). The SNPR provides specific regulatory language, and also identifies a list of possible hourly emissions test alternatives upon which comment is requested. On July 9, 2007, EPA extended the original comment period 30 days. 72 Fed. Reg. 37,156.

Southern Company and its subsidiaries operate 39,000 megawatts of electric generating capacity and serve over 4 million customers in the Southeastern United States. Southern Company and its subsidiaries have also been directly affected by the uncertainty associated with NSR applicability, as evidenced most notably by the allegations made against Alabama Power, which are currently on appeal to the United States Court of Appeals for the Eleventh Circuit. As such, Southern Company has a vested interest in revisions to the NSR program, particularly those focused directly on EGUs.

Southern Company fully supports EPA's efforts to adopt an hourly rate test for determining whether a project will trigger NSR preconstruction permitting requirements at EGUs. Southern Company agrees that the adoption of an hourly rate emissions test is well within EPA's discretion, and agrees that an hourly rate test will facilitate the completion of projects that will improve the safety, reliability, and efficiency of the nation's electricity supply without any detrimental impact to the environment. However, Southern Company also believes that the SNPR fails to address the causation aspect of the NSR analysis. Southern Company will not support any NSR applicability test that fails to take into account whether the project analyzed actually results in an emissions increase.

Assuming causation is explicitly addressed as part of any new emissions test, Southern Company supports EPA's preferred Option 1 – that is, the addition of an hourly emissions test to the annual test already established under the existing NSR regulations. This combined approach will provide the most meaningful and comprehensive analysis of the possible effects a project may have on a unit's emissions, while simultaneously simplifying and clarifying the NSR emissions analysis. Under Option 1, Southern Company supports the adoption of the NSPS maximum achievable hourly emission rate test, referred to as Alternative 5 in the SNPR. Southern Company supports Alternative 5 because consistency with the NSPS program will further ease the regulatory burden associated with determining the applicability of new source permitting and regulatory requirements to projects at existing EGUs. Southern Company cannot support the Alternative 1 statistical approach as proposed, but could support a revised version of the "achieved" test, as described in more detail below.

Southern Company appreciates the opportunity to comment on EPA's proposed EGU hourly emissions rate test, and offers the following comments on the supplemental proposal.

II. An Hourly Rate Test Promotes Safety, Reliability, and Efficiency

In its supplemental proposal, EPA restates the conclusion of its June 13, 2002 report to the President:

EPA concludes that the NSR program has impeded or resulted in the cancellation of projects which would maintain and improve reliability, efficiency and safety of existing energy capacity. Such discouragement results in lost capacity, as well as lost opportunities to improve energy efficiency and reduce air pollution.

72 Fed. Reg. at 26,204. It has been Southern Company's experience that this conclusion is accurate – NSR has indeed served as a barrier to many projects intended to ensure safe, reliable, and efficient electricity production. Even those projects that do not trigger NSR are often delayed, or at least require the expenditure of a significant amount of time and effort to complete the NSR analysis. These constraints have affected Southern Company's efforts to provide the safest and most efficient and reliable energy production for the natural and human resources utilized.

For example, the NSR program has forced Southern Company and its subsidiaries, as well as other utilities around the country, to forgo efficiency projects that would allow existing units to produce the same amount of electricity from less fuel, or more electricity from the same amount of fuel. An hourly rate test will allow for efficiency projects because efficiency projects do not increase emissions on an hourly basis.

An hourly emissions test will also ensure that sources will not be penalized for performing projects that simply make EGUs more reliable. In many of the recent NSR enforcement actions, the current annual test has been used to argue that various component replacement projects could result in an emissions increase simply by theorizing that the unit might avoid a hypothetical future forced outage that might have occurred if the project had not been performed. This interpretation of the annual emissions test is unreasonable in that it fails to

account for the overall availability of the unit both before and after the project. Nevertheless, it discourages reliability projects that the proposed hourly test would allow to proceed. Reliability projects are not only necessary to ensure a dependable source of electricity, they also help ensure that catastrophic failures that could present a safety hazard to utility employees are avoided to the greatest extent possible. By discouraging reliability projects, the annual test, as interpreted in the enforcement initiative, places the nation's power supply at risk and endangers those working to provide that power.¹

The removal of the disincentives to efficiency and reliability projects through adoption of an hourly emissions rate test will not result in any detrimental impact to the environment. As summarized in the SNPR, and demonstrated more fully in EPA's Technical Support Document ("TSD"), EPA determined that the adoption of an hourly emissions test for EGUs will not result in greater emissions to the atmosphere, even under the very conservative assumptions employed by EPA in its analysis. The TSD clearly shows that even if EGUs alter their operations in ways far more dramatic than actually expected, county-level emissions will not increase and local air quality will not diminish as a result of the adoption of an hourly emissions test for determining NSR applicability.

It is also important to note, as EPA pointed out in its initial 2005 proposal, that NSR "is not designed to cut back on emissions from existing major stationary sources through limitations on their productive capacity, but rather to ensure that they will install state-of-the-art pollution controls at a juncture where it otherwise makes sense to do so." 70 Fed. Reg. at 61,088. As the United States Supreme Court recognized in its landmark Chevron case, Congress intended the nonattainment provisions of the Act "to accommodate the conflict between the economic interest

¹ When causation is properly accounted, the annual test itself focuses very heavily on changes in hourly emission rates.

in permitting capital improvements to continue and the environmental interest in improving air quality.” Chevron U.S.A. Inc. v. Natural Res. Def. Council, Inc., 467 U.S. 837, 851 (1984). Although tension between these competing but fundamental purposes is likely to be overlooked or summarily dismissed by some commenters, Southern Company believes that it is important to allow each of the Clean Air Act programs to work together in the manner designed by Congress. The significant emissions reductions EPA expects to achieve through the implementation of other Clean Air Act programs are a testament to the fact that the Clean Air Act works well as a whole. Programs such as the Clean Air Interstate Rule, the Clean Air Mercury Rule, and the Clean Air Visibility Rule, as well as the process for establishing the National Ambient Air Quality Standards and implementing Reasonably Available Control Technology and Measures to meet those standards, are all designed to reduce emissions and improve air quality to protect public health and the environment. Those programs are expected to achieve significant emissions reductions from EGUs in a remarkably short time frame.

In contrast to these programs, “the primary purpose of the major NSR program is not to reduce emissions, but to balance the need for environmental protection and economic growth.” Id.; see also 72 Fed. Reg. at 26,204. The NSR program is simply not designed to reduce emissions, and is a poor substitute for those that are. Any attempt to use the NSR program to continually ratchet down emissions will only distort the very incentives NSR is designed to balance.

Accordingly, Southern Company supports the adoption of an hourly rate test to ensure that it, and other utilities around the country, has the flexibility to perform common-sense projects designed to improve the safety, reliability, and efficiency of existing EGUs.

III. EPA Is Legally Justified in Proposing an Hourly Test

Not only does the hourly test make sense from a practical perspective, an hourly emissions rate test is also well within EPA's regulatory discretion. EPA's 2005 proposal for an hourly emissions test was in part a response to the decision by the United States Court of Appeals for the Fourth Circuit in United States v. Duke Energy, 411 F.3d 539 (4th Cir. 2005), in which the court held that EPA must read the 1980 Prevention of Significant Deterioration ("PSD") regulations to contain an hourly test. However, EPA also justified its hourly emissions test proposal by stating that it would allow owners and operators of EGUs "to make changes that, without increasing existing capacity, promote the safety, reliability, and efficiency of EGUs." 70 Fed. Reg. at 61,083. EPA recognized that the current emissions test discourages EGUs from undertaking such beneficial projects. Id.

The Fourth Circuit's decision was subsequently vacated and remanded by the United States Supreme Court on April 2, 2007. Env'tl. Def. v. Duke Energy, 127 S. Ct. 1423, 167 L. Ed. 2d 295 (2007). EPA published the SNPR roughly a month later, noting that the Supreme Court's decision does not foreclose EPA from revising the regulations to adopt an hourly rate test, so long as it has a rational reason for doing so. 72 Fed. Reg. at 26,204. Although EPA recognizes in the SNPR that Duke Energy eliminates the national consistency concerns raised in its initial 2005 proposal, EPA continues to propose the hourly rate test in order to avoid discouraging safety, reliability, and efficiency projects at EGUs. Id. In fact, the Supreme Court's decision in Duke Energy confirmed that the Clean Air Act gives EPA the discretion on how to interpret and apply the statute's definition of "modification." Env'tl. Def. v. Duke Energy Corp., 127 S. Ct. 1423, 1434 (2007) ("EPA's construction [of the term 'modification'] need do no more than fall within the limits of what is reasonable, as set by the Act's common definition."). Thus, the

Court's decision does not foreclose an hourly emissions test as some commenters may suggest. Rather, the Court merely determined that the specific NSR regulations promulgated in 1980 do require an annual emissions analysis. Nothing in the Supreme Court's opinion precludes EPA from changing that test as needed to better accomplish the goals of the Clean Air Act.

Likewise, the D.C. Circuit has also recognized that the Clean Air Act does not require an annual emissions test. Instead, the D.C. Circuit has determined that the word "increases" in the definition of "modification" found in the Clean Air Act is ambiguous, thus allowing EPA the discretion to interpret the term in any manner that reasonably comports with the policy of the Act. New York v. EPA, 443 F.3d 880, 888-889 (D.C. Cir. 2006) ("Congress's use of the word 'increases' necessitated further definition regarding rate and measurement for the term to have any contextual meaning."); New York v. EPA, 413 F.3d 3, 23-24 (D.C. Cir. 2005) ("Different interpretations of the term 'increases' may have different environmental and economic consequences, and in administering the NSR program and filling in the gaps left by Congress, EPA has the authority to choose an interpretation that balances those consequences.")

EPA is given deference for any reasonable interpretation of the statute. Chevron, 467 U.S. at 843-44. The adoption of an hourly emissions rate test for EGUs is a reasonable interpretation because it is consistent with the underlying policy of Clean Air Act's NSR program – it allows EGUs to perform needed efficiency and reliability projects to meet growing demand while maintaining the level of environmental protection assured by the Clean Air Act.

The proposed alternatives for an hourly emissions rate test are also consistent with the D.C. Circuit's command that emissions increases be defined in terms of "actual" emissions. See New York v. EPA, 413 F.3d 3, 40 (D.C. Cir. 2005). Each of the six alternatives provided in the

SNPR requires a calculation based on actual emissions data; none of the alternatives rely on allowable or potential emissions.

For example, Alternatives 1 through 4 for determining a unit's maximum achieved hourly emissions rate rely on either a statistical analysis of actual emissions data or a single hour of actual emissions data to measure whether a unit will experience an emissions increase as a result of a project. Likewise, the NSPS-like maximum achievable hourly emissions tests proposed as Alternatives 5 and 6 are based on the level of operations an EGU was actually and legally capable of accommodating in the five years preceding the project. The NSPS regulations make it clear that the achievable test is based on actual emissions by contemplating the use of material balance, continuous monitoring, or manual emissions tests to determine a unit's maximum achievable hourly emission rate where an emissions factor analysis remains inconclusive. See 40 C.F.R. § 60.14(b). Each of these forms of measurement depends on actual emissions data; they are not in any way based on an "allowable" or "potential" emissions calculation (terms associated with *annual* emission totals in any event). Finally, even the output-based alternatives provided in the SNPR, regardless of whether "achieved" or "achievable," are firmly grounded in "actual emissions" – the output-based approach simply measures "actual emissions" per unit of energy rather than per unit of time.

Accordingly, EPA's proposed alternatives for an hourly emissions test for NSR applicability are authorized under the decisions of the United States Supreme Court and the D.C. Circuit Court of Appeals.

IV. Causation

Before addressing the various alternatives in the proposal, it is necessary to comment specifically on the central role of causation in any emissions test. The Clean Air Act itself

clearly establishes a causation requirement for both the NSR and NSPS programs; that is, any emissions increase at a unit must be *caused* by a project before the project will trigger new source permitting and regulatory requirements. Specifically, the NSPS and NSR statutes require causation by defining “modification” as “any physical change in, or change in the method of operation of, a stationary source which increases the amount of any air pollutant emitted by such source or which results in the emission of any air pollutant not previously emitted.” 42 U.S.C. § 7411(a)(4); see 42 U.S.C. § 7479(2)(c) (emphasis added).

Accordingly, therefore, simply projecting an increase, measuring an increase, or showing that one has occurred at a given EGU, is not the end of the analysis. Once an increase in emissions is identified (on an hourly or annual rate basis), the Clean Air Act requires that the increase must have resulted from some change before NSR can be triggered.

The current NSR regulations implement this causation requirement by defining “major modification” as “any physical change in, or change in the method of operation of, a major stationary source that would result in ... a significant emissions increase ... and a significant net emissions increase ...,” 40 C.F.R. § 52.21(b)(2), 52.24(f)(4). The rules clarify this definition by requiring sources to exclude “demand growth” emissions, 40 C.F.R. § 52.21(b)(41)(ii)(c). Specifically, sources must exclude from projected actual emissions “that portion of the unit’s emissions following the project that an existing unit could have accommodated during the consecutive 24-month period used to establish the baseline actual emissions ... and that are also unrelated to the particular project, including any increased utilization due to product demand growth.” 40 C.F.R. § 52.21(b)(41)(ii)(c). This “demand growth” exclusion has been upheld by the D.C. Circuit. New York v EPA, 413 F.3d 3, 33 (D.C. Cir. 2005).

As is made clear by the discussion in part V of these comments, *infra*, any statistical method will result in some level of false positives – i.e., emissions increases that are the result of (i) independent factors or, indeed, (ii) the statistical method itself. This fact highlights the critical importance of statutory causation to the NSR analysis.

Southern Company is very concerned however, that the SNPR fails to address (or even mention) the causation aspect of the NSR applicability analysis. Not only does the SNPR fail to specify that the causation element will be incorporated into the proposed EGU hourly emissions test alternatives, but certain statements within the SNPR could possibly be interpreted to mean that causation would not be considered as a part of the new hourly test. For example, EPA states twice in its description of Option 2 that “any increase in the emissions under the maximum hourly achievable emissions test would logically be attributed to the change.” 72 Fed. Reg. at 26,206 & 26,220. This statement is not only false – another cause, unrelated but contemporaneous with the change, could result in the calculation of an hourly emissions increase² – it also fails to incorporate the statutorily-required causation element of the NSR applicability analysis.

The proposed regulatory language provided in the SNPR also contains a provision that could be easily misinterpreted. Proposed 40 C.F.R. § 51.167(f)(1)(iii), entitled “Post-change emissions – actually achieved,” deems an emissions increase to occur if any hourly rate in the five years following the project exceeds the baseline maximum hourly emission rate determined under Alternatives 1 through 4. In the absence of clarification from EPA, this provision could be misinterpreted to mean that either NSR permitting is required, or perhaps even that an NSR violation has occurred, merely because a unit exceeded its baseline hourly emission rate less than

² For example, a minute change in the composition of the coal combusted (by definition excluded from NSR) could result in the calculation of an emissions increase under any of the proposed alternatives, even though the increase was not attributable to a particular physical or operational change.

five years after a project. This interpretation fails to acknowledge that any emissions increase must be caused by a non-excluded physical or operational change before it will trigger NSR permitting. Because this interpretation fails to take causation into account, it would contradict the express requirements of the Clean Air Act.

Option 1, by retaining the annual test, would address causation in the annual total emissions step. Nevertheless, the hourly test itself must also incorporate the causation aspect of the NSR analysis as well so that it may function as a stand-alone test for projects that do not cause an increase in a unit's maximum hourly emissions rate. Accordingly, Southern Company requests EPA clarify that the causation element of the NSR analysis will be incorporated into the new EGU hourly emissions test.

V. Southern Company Supports Adoption of EPA's Preferred Option 1

Assuming causation is properly addressed, Southern Company supports EPA's preferred "Option 1," which adds an hourly emissions rate test to the existing annual emissions test, resulting in a four-step analysis for determining emissions increases under NSR.³ Southern Company supports Option 1. It represents the most comprehensive and meaningful analysis of a project's effect on emissions. Even though Option 1 involves a four-step analysis, it will clarify and simplify the NSR emissions analysis because the vast majority of projects have no effect on a unit's maximum hourly emissions rate and would therefore only require two steps of the analysis. In addition, Southern Company supports Option 1 because it retains annual netting and significance levels, two essential facets of the NSR emissions analysis. Southern Company prefers Option 1 over Option 2, which, at least for EGUs, would result in the wholesale replacement of the existing (and recently revised) annual emissions test.

³ The four steps listed in the SNPR are (1) physical change or change in the method of operation, (2) hourly emissions increase, (3) annual significant emissions increase, and (4) annual significant net emissions increase.

In particular, Southern Company believes that the NSR program must retain annual netting and significance levels as a necessary part of the emissions analysis associated with determining NSR applicability for projects at existing EGUs. With regard to netting, the D.C. Circuit has held that the failure to implement a bubble, or netting, approach is unreasonable and contrary to the expressed purposes of the PSD provisions of the Clean Air Act. Alabama Power v. Costle, 636 F.2d 323, 401 (D.C. Cir. 1979). The court's Alabama Power decision makes it clear that "Congress wished to apply the [PSD] permit process ... *only* where industrial changes might increase pollution in an area, not where an existing plant changed its operations in ways that produced no pollution increase." Id. (emphasis added). See also New York v. EPA, 413 F.3d 3, 26 (D.C. Cir. 2005) ("Under Alabama Power and the 1980 rule, a physical or operational change constitutes a 'modification' subject to NSR only if it results in a net increase in emissions.").

EPA states in the SNPR that it is "unclear" whether the D.C. Circuit would have required netting if the "test before the Court only considered the increases from the project under review and not source-wide increases from multiple projects." 72 Fed. Reg. at 26,220. On the contrary, the court specifically rejected any test that "only consider[s] increases from the project." The opinion plainly states that "[w]here there is no net increase from contemporaneous changes within a source, . . . PSD review, whether procedural or substantive, cannot apply." Alabama Power, 636 F.2d at 403 (emphasis added). As such, EPA's hypothetical "test [that] only consider[s] the increases from the project" would be just as unlawful under Alabama Power as the 1978 rule struck down by the court. Therefore, Option 2, which fails to allow for contemporaneous netting, is also unlawful under Alabama Power, and should be rejected in favor of Option 1.

In Alabama Power, the D.C. Circuit also addressed significance thresholds. Although the court held that EPA has the discretion to adopt significance levels, the court also expressly indicated that significance thresholds, along with netting, were necessary to “allow for improvement of plants, technological changes, and replacement of depreciated capital stock, without imposing a completely disabling administrative and regulatory burden.” Id. at 200. Southern Company agrees with this analysis, and urges EPA to adopt an emissions test that continues to incorporate significance thresholds to help minimize the regulatory burden imposed on projects that will not have a meaningful impact on the environment.

Southern Company supports the adoption of Option 1, which retains significance levels and netting as part of the existing NSR emissions test.

VI. Southern Company Supports Adoption of the NSPS Test (Alternative 5) or, in the Alternative, a Revised Version of the Statistical Approach (Alternative 1)

Within Option 1, the SNPR provides six “alternatives” for consideration and comment. The six alternatives presented in the SNPR are essentially derived from three basic questions:

- (1) Should the test be based on “achieved” or “achievable” emission rates?
- (2) Should the test be input-based (lb/hr) or output-based (lb/MWh)?
- (3) If the test is based on “achieved” emissions, should the test be based on a statistical analysis or on a single historical value (one-in-five-year baseline)?

Southern Company provides comments below on each of the above questions. As explained below, Southern Company supports Alternative 5, the “NSPS test,” because it provides the greatest level of clarity (by employing a test with which sources are already familiar) and provides the greatest simplification of the analysis (by aligning the first step of the NSR emissions test with the NSPS emissions test), while maintaining the same level of environmental protection as each of the other alternatives. Southern Company would also support a corrected

version of the statistical approach proposed as Alternative 1, should EPA choose to adopt an achieved test.

A. Achieved or Achievable?

Both the achievable and the achieved tests are consistent with the fundamental purpose of NSR, namely balancing the need for environmental protection with the need for economic growth. Southern Company also agrees with EPA's assertion that the achieved test and the achievable test (as defined in the SNPR) will rarely, if ever, lead to different results in light of the statutory causation element of NSR.

However, the achievable and achieved tests differ substantially in the level of difficulty and effort required to complete the analysis. The achievable test will be much simpler to apply to a particular project than the achieved test because EGUs will already have conducted the NSPS achievable emissions test to determine NSPS applicability for the project. On the other hand, if an achieved test is adopted, sources will be required to conduct at least two different emissions analyses for the same project – one for NSPS and at least one for NSR – where a single test would otherwise suffice. If the NSR program is revised to incorporate the NSPS test, as Southern Company recommends, only one emissions test will be necessary for all projects that do not trigger NSPS.

Because a single test would minimize the regulatory burden associated with new source permitting and regulatory requirements while maintaining the same level of environmental protection, and in light of the fact that both the achievable and achieved tests will provide the same result in nearly all cases, Southern Company recommends EPA adopt Alternative 5.

Under this test, EGU's would first make an engineering determination of the impact of a given activity on the projected maximum hourly emission rate of the unit. This rate can be

influenced in three ways: (1) by changing the inherent maximum projected pollutant generating content of the fuel (e.g., increasing the sulfur content of coal); (2) by changing the stoichiometry of the boiler or performance of other systems (such as pollution control equipment) in a manner that affects the maximum projected pollutant formation or removal rate; or (3) by changing the maximum projected hourly fuel input rate. Engineering judgment as to each of these factors would constitute a projection of whether the maximum hourly rate would increase as a result of the project. If the analysis is unclear, material balances, or stack test or emissions monitoring would be used to determine the result.

B. Input-based or Output-based?

Although Southern Company certainly agrees with EPA that efficiency projects help protect the environment by ensuring that our natural resources are utilized in a responsible manner, an NSR applicability test based on output is not necessary to encourage the development and implementation of efficiency projects at EGUs and may, in fact, be counter-productive. NSR aside, utilities already have a strong economic incentive to improve efficiency, given that fuel costs make up a very significant portion of the variable costs associated with the production of electricity. All that is needed to encourage efficiency projects is the assurance that NSR will not inhibit (or prohibit) such projects; no additional incentive is needed.

Furthermore, even if an output-based test could perhaps increase the already-existing incentive to perform efficiency projects, such a test would likely have several undesirable side effects. First, an output-based test would discourage any projects that do not affect efficiency. Unless a project affirmatively improves efficiency, even a slight decline in efficiency in the future could result in the theoretical calculation of an emissions increase for the project – even if no change in the input-based rate occurs. This concern is particularly relevant to EGUs because

all EGUs experience cyclical declines in efficiency over time. Generally, the efficiency of an EGU will slowly degrade between planned outages, and can even fall rapidly if certain components suddenly fail. These losses in efficiency are recovered to the greatest extent possible during the planned outages, and the cycle begins again. As a unit's efficiency slowly degrades between outages, an output-based test would indicate an emissions increase occurred regardless of whether any individual project conducted during the previous outage had any effect on efficiency (or emissions), and even regardless of whether a non-excluded project was performed at all. Accordingly, a mandatory output-based test is unworkable.

Consider the circumstance of a unit which experiences a drop in efficiency due to a malfunction. It may be possible to perform a project that would recover at least some of the lost efficiency so that the unit could continue to operate as efficiently as possible until the next planned outage, when a more complete solution could be implemented. Because this "partial fix" project would not fully recover the efficiency losses caused by the malfunction, an output-based emissions test could indicate that an emissions increase had occurred simply because the unit would have been more efficient before the malfunction than after the project. Faced with these circumstances, the operator of an EGU might forgo the partial fix project, and the associated efficiency improvement. In contrast, an input-based test would allow the pre-existing economic incentive for efficiency improvements to control, and would not interfere with an owner's efforts to ensure its EGUs operate as efficiently as possible at all times.

Additionally, because the efficiency of an EGU generally decreases at lower loads, a unit will have a higher "output-based" hourly emission rate at those lower loads. As a result, an hourly test based on output emission rates could show an "emissions increase" simply because a unit operates a lower load (and lower efficiency) than the load upon which its maximum

historical rate was based.⁴ Similarly, certain types of emission control equipment also perform less efficiently at lower loads, which could also result in a higher “output-based” emissions rate than previously calculated. Moreover, sorting and selecting historical data based on maximum heat input exacerbates these concerns by eliminating potentially high “output-based” emissions rates from the calculation. More generally, however, these practical realities reveal the inherent difficulties associated with establishing an NSR applicability test based on output.

Because there already exists sufficient economic incentive for efficiency projects, and because any increased incentive generated through the adoption of an output-based test would come only at the cost of discouraging other needed projects, Southern Company opposes the mandatory output-based tests identified as Alternatives 2, 4, and 6 in the SNPR. However, in light of the straightforward treatment of many efficiency projects under such a test, Southern Company would support using the output-based test as an option which a source could elect to apply at its discretion.

C. Achieved Alternatives: Statistical Analysis or Single Historical Value?

Southern Company believes that both the statistical and historical “achieved” alternatives proposed in the SNPR suffer from several flaws that must be remedied if EPA chooses to adopt an emissions test based on the maximum achieved hourly emissions rate of a unit. As part of Southern Company’s effort to review and analyze the proposed maximum achieved hourly emissions rate alternatives, Southern Company personnel conducted a simulated baseline emissions analysis for three EGUs. That analysis revealed that, as currently proposed, each of the achieved emissions tests will be extremely difficult to conduct and will likely produce

⁴ See Attachment A, comparing the input-based emission rates of a Southern Company unit to the output-based emission rates of the same unit over various loads. Although the input-based emission rates are a function of load, high apparent output-based rates occur over the entire useful load range. (Data for start-up and shutdown periods have been excluded).

unintended and arbitrary results in many cases. Notably, Southern Company's analysis revealed that the achieved alternatives will usually result in the calculation of an emissions increase even if a unit generates the identical emissions after a project as it did during the lookback period. Southern Company strongly opposes any emissions test that will indicate an emissions increase occurred even if a unit duplicates its baseline emissions performance exactly. However, Southern Company could support a variation of the input-based, statistical alternative described in the SNPR as Alternative 1, if changes are made to address the various concerns noted below.

1. Achieved Alternatives: Initial Concerns

Initially, Southern Company requests that EPA reject the historical "one-in-5-year baseline" approach because it will likely provide a poor representation of a unit's true maximum hourly emission rate characteristics. Relying on a single hour of emissions from the previous five years is simply impractical. Although the proposal would rely on five years of historical data, the maximum emissions rate could easily be exceeded during at least a single hour in the future due to the natural variation in the emissions characteristics of EGUs.

Southern Company also remains concerned that neither of the proposed achieved tests will alone suffice because the proposed tests are only well-suited for regulated NSR pollutants that are monitored continuously. Although EGUs generally monitor more pollutants continuously than most other source categories, there are still a number of regulated NSR pollutants that EGUs do not measure continuously. Given that EGUs only continuously monitor some of the regulated NSR pollutants, EPA will have to adopt multiple emissions tests if either the statistical or the historical achieved alternatives is selected. EPA recognizes this concern in the SNPR with regard to the statistical approach, and states that another emissions test will also be adopted should EPA choose to adopt either Alternative 1 or 2. 72 Fed. Reg. 26,216

(“Because Alternatives 1 and 2 can be used only if one has CEMS or PEMS data, we cannot adopt these alternatives alone.”)

However, the lack of continuous hourly data is also a concern for the historical approach as well (Alternatives 3 and 4) because the maximum historical achieved value taken from non-continuous measurement data (such as stack tests) will not take into account the natural variability of a source’s emissions characteristics. It will be a very rare case indeed when a brief, periodically-performed Reference Method test will coincide with the maximum achieved hourly emissions rate at a unit. Thus, if either the statistical or historical approach is eventually chosen, additional tests must also be adopted for those regulated NSR pollutants for which continuous data is unavailable, unnecessarily complicating the NSR emissions analysis that could more easily be accomplished with a single test.

Both the statistical and historical approaches also fail to take into account the use of adjustment factors in calibrating the continuous emissions monitors (“CEMs”) that provide the hourly data used to complete the analysis. CEMs are calibrated every three months during the required quarterly Relative Accuracy Test Audit (“RATA tests”). As part of the calibration, a certain adjustment factor is adopted to correct the CEMs readings to match the results of a contemporaneous Method test. As that adjustment factor changes over time, the same level of emissions may result in slightly different CEMs readings, once corrected with a slightly different adjustment factor. There remains a significant possibility that these slight adjustment factor changes could result in a CEMs reading that exceeds either the highest single historical hourly emissions rate previously recorded, or the Upper Tolerance Limit (“UTL”) calculated as part of the statistical approach, even at the exact same level of emissions. Failure to take changes in

these adjustment factors into account could result in the calculation of an emissions increase even if the emissions profile of the unit has not changed whatsoever.

2. Achieved Alternatives: Simulated Analysis of Alternatives 1 & 2

Despite the initial concerns noted above, Southern Company conducted a simulated analysis of the statistical approach to determine how the proposed emissions tests would operate in practice. The comments below describe Southern Company's simulated analysis, the problems encountered, and possible solutions that Southern Company could perhaps support as an appropriate and viable "maximum achieved hourly emissions rate" test. Each of these revisions to the proposal would be a natural outgrowth of the UTL method proffered in the SNPR.

To perform the simulated achieved hourly emissions rate analysis, Southern Company used the statistical approaches proposed in the SNPR as Alternatives 1 & 2 to determine the baseline "maximum achieved hourly emissions rate" through calculation of the UTL based on continuous emissions data for three units for SO₂ and NO_x. The test was designed to determine the maximum achieved hourly emission rate from those units as if a project was scheduled to be performed at those units in the near future. The purpose of the simulation was to determine the level of difficulty associated with implementing the proposed tests and to compare the input-based and output-based alternatives of the statistical approach. The simulation also allowed Southern Company personnel to compare the various statistical approaches to the historical approach and to the NSPS achievable test as well.

Southern Company calculated the UTL as proposed, using the top 10% of the data for each of the three selected units in four different ways: (1) input-based, sorted by heat input, (2) input-based, sorted by hourly emissions rate, (3) output-based, sorted by heat input, and (4)

output-based, sorted by hourly emissions rate. Calculating these four scenarios at each of the three selected units for both SO₂ and NO_x provided Southern Company a total of 24 scenarios for comparison to help determine how the proposed statistical test would operate in practice.

The enormous effort required to conduct these simulated calculations revealed that the statistical approach is time intensive. Under the proposed statistical approach, a source must analyze every possible 365-day period during the five years preceding the change to determine which 365-day baseline period provides the “maximum achieved hourly emission rate” for each project. It took many man-hours for Southern Company to perform the emissions analyses. First there are 830 individual 365-day periods in every five year lookback period. Each individual scenario required managing 8760 hours of data. Accordingly, to do the UTL calculation, each pollutant at each unit required manipulating nearly 7.3 million data points for each version (heat-input / emissions / output-based sorting). Southern Company dedicated significant computer resources at once to the analyses in order to ensure they would be completed prior to the deadline for submission of comments on the supplemental proposal.

One of the more difficult aspects of the baseline calculations involved the exclusion of certain data points. Specifically, excluding data points that occur during periods of malfunction is an extremely difficult and time-consuming process that requires searches through historical records and event logs and comparison of those records with specific CEMs data points. Although perhaps a more automated process could be developed in the future to attempt to manage this administrative burden, Southern Company remains concerned that the burden this analysis places on regulated sources would be unnecessarily heavy, and many companies may not have the resources to conduct such an intensive analysis themselves and would be forced to hire consultants to perform the analysis. Determining the UTL for every 365-day period over a

five-year baseline for every non-excluded project will place a considerable burden on sources, particularly when compared to the relatively simple NSPS approach proposed as Alternative 5.

Most importantly, the results of the simulated baseline analyses also revealed a critical flaw in the statistical approach – the statistical test will almost always show an emissions increase, regardless of whether any change in emissions occurs at all. Of the 24 different scenarios analyzed 23 scenarios resulted in a UTL that was lower than many of the individual data points in the baseline period itself. This result occurred even when calculating the UTL for the 99.9th percentile of the population at a 99 percent confidence level.⁵ In fact, in one scenario, the baseline emissions data contained nearly 400 individual data points that exceeded the UTL-derived “maximum achieved hourly emissions rate” that was determined according to the proposed statistical approach.⁶ In other words, the analysis showed that even if a unit duplicates its lookback period emissions exactly in the years following a project, hour-by-hour, the proposed statistical calculation will almost always result in the calculation of emissions increases.

These results are not unique to Southern Company’s units. Rather, as proposed, the UTL statistical method itself predicts that the natural variability of the data will result in several exceedances of the UTL in the future, even if the unit continues to operate exactly as it did during the lookback period.

The 99.9 percentile UTL defines a level at which there is a high confidence that 99.9 percent of the data used to generate the UTL lies below that level. In other words, only 1 in

⁵ In addition, Southern Company’s analysis reveals that performing the statistical test on anything less than the 99.9th percentile of the population or at anything lower than a 99 percent confidence level will only exacerbate the concerns noted above. As such, Southern Company strongly opposes any lower percentile or confidence level.

⁶ See Attachment B, comparing actual hourly emission rate data against the UTLs calculated as proposed (sorted by emissions).

1000 data points in the underlying data set should lie above the UTL. But the UTL is then compared against more than 1000 data points. It is compared against 8760 hours/per x 5 years = 43,800 data points. A failure rate of 1 in 1000 would positively predict that the UTL would be exceeded 44 times! Unfortunately, any predicted and expected failures of the emissions increase test based solely on the statistical method chosen is not acceptable given the possible ramifications of triggering NSR.

Given this approach, the odds of a given EGU showing an emissions increase are very high. With a 99.9 percentile UTL, and assuming the idealized situation of statistical independence for illustration, there would be a $(0.999)^{43,800} = 0.000000000000000009\%$ chance of no failures in a five year period. In other words, there is an essentially 100% chance that a given unit will show an emission increase where the baseline data is simply repeated in the future. Even if one assumes that the top 10% of the data is normally distributed (it is not), such that the resulting UTL need only be compared against the top 10% of the data for expected failures, and on top of that accounts for giving sources the choice of a single 365 day-based UTL by restricting the comparison period to a single year, the absolute best that could be said is that there is a $(0.999)^{876} = 42\%$ chance that a given unit will show an increase in emissions in five years if the data simply repeats itself. The actual instances of a unit which show an increase (taken from Southern Company's work (1 of 24) and from Tables 9 & 11 of the technical analysis attached to the comments of the Utility Air Regulatory Group (2 of 32)) suggests a failure rate of over 95%. This result is arbitrary and meaningless as a test for NSR applicability.

Moreover, these results are particularly troubling in light of EPA's statement in the SNPR that "you must treat an emissions increase as occurring if the emissions rate actually achieved in any 1 hour during the 5 years after the change exceeds the pre-change maximum actual hourly

emissions rate.” 72 Fed. Reg. at 26,216. This requirement renders the statistical test absolutely unworkable – a test that results in the calculation of an emissions increase even if a unit precisely duplicates every single hour of its past emissions performance cannot possibly function as an appropriate test for determining an emissions increase under NSR.⁷

In addition, demanding a comparison of every single future hour to a statistics-based UTL is also problematic due to the lack of meaningful guidance on the method for predicting, prior to a given project, future maximum hourly emission rates. The SNPR contains only a single paragraph regarding the method for projecting a “Post-Change Emissions Rate” that provides no practical advice on how to predict future maximum hourly emissions rates. See 72 Fed. Reg. at 26,225. The lack of meaningful guidance on the method for projecting future maximum hourly emission rates, combined with the significant likelihood that a future hourly emission rate will exceed the statistically-derived UTL, leaves sources in a very precarious position when deciding whether to obtain a pre-construction permit, particularly given the effort and expense required to obtain a permit and the possible consequences of improperly failing to do so.

Comparing the statistically-derived UTL to every future hourly emissions rate could also lead to other unintended and inappropriate consequences due to the heavy influence of variability in the baseline emissions on the UTL. The 24 scenarios calculated by Southern Company confirmed that the variability of the baseline data is a key factor in the baseline UTL – the greater the variability in the top 10% of the emissions data, the higher the standard deviation and therefore the higher the UTL. It is certainly appropriate to take into account the natural variability of a source’s emissions profile to some extent, but an emissions test that depends so

⁷ It also seems to ignore the statutory causation requirement, which must be incorporated.

heavily on the variability of baseline emissions, particularly when coupled with the problems identified above, punishes units that maintain a more consistent level of emissions performance. For instance, under the statistical approach, units with large and frequent upsets, whose emissions data points are very scattered throughout the baseline period, will have a much higher UTL than a similar unit with an identical mean emissions rate but a much more stable hourly emissions rate overall. Peaking units, units whose operations vary seasonally, and units with more variability in fuel content will also have a higher standard deviation and a higher UTL than base-loaded units whose operations do not fluctuate as dramatically.

It is also important to note that a unit's emissions variability is not always constant. An EGU's hourly emissions rate may become more or less variable over time. A unit that experiences greater variability in emission rates following a project will be restricted by an inappropriately low UTL even if the increase in variability is not the result of the project. Because variability is even more difficult to predict than actual maximum emissions, these circumstances also add to the complexity and difficulty of relying on a statistically-derived baseline without also employing a statistical analysis for purposes of assessing post-project emissions.⁸

In short, the comparison of a statistically-derived baseline maximum hourly emission rate to the maximum hourly emission rate achieved during a single hour after a project is simply unworkable as proposed, and will result in the calculation of an emissions increases following nearly every project, regardless of whether the a project actually has any affect on emissions.

3. Achieved Alternatives: Suggested Corrections on Alternative 1

⁸ See Attachment C, comparing actual hourly emission rate data against UTLs calculated as proposed (sorted by emissions). This illustrates the severe impact of variability on the relative magnitude of the UTL versus the mean of the actual data.

As noted above, Southern Company's chief concern with the statistical approach is the requirement that sources compare a very large set of individual post-project hourly emissions rates (over 43,000) to a statistically-derived baseline rate. In addition, Southern Company remains concerned about the absence of meaningful guidance on projecting future emissions rates. Southern Company believes that both of these concerns can be addressed through the adoption of the achievable test. Alternatively, EPA could revise the proposed a statistical method in one or more of the following three ways.

1. Increase the UTL to achieve a true, 99% likelihood that a given unit will not show an emissions increase when the data is simply repeated.
2. Reduce the number of data points against which the UTL must be compared in the future to ensure a 99% likelihood that a given unit will not show an emissions increase when the data is simply repeated.
3. Use a statistical approach to measure future emissions rates in order avoid comparing statistical calculations to individual data points

Taking each possible revision in turn, first, increasing the UTL could ensure that 99% of all data points within a repeated baseline would lie below the UTL over a five year period. To approximate this statistically, the 365-day, top 10% effective UTL must be set at 99.9989%.⁹ Again, this assumes that the top 10% of data points are normally distributed, meaning that this number may still be too low. This could easily and appropriately be accomplished within the framework of EPA's proposal by simply calculating the UTL over a shorter baseline period. Use of a shorter baseline period within the 5 year lookback is logical given that the new hourly test is intended to measure the short-term maximum emissions rates of a unit. There is nothing

⁹ The UTL must be set such that $x^{876} = 99\%$. Solving gives $x = 0.9999885$.

inherently appropriate about the choice of a year's worth of data or even the top 10% of a year's worth of data, and such a choice is arguably inconsistent with the desire for focusing on short-term maximum emission rates. A possible approach to addressing this concern is to use a full data set, but over a smaller contiguous block of hourly data. If contiguous blocks of 24 hours or 168 hours are used to calculate the mean, the standard deviation, and the UTL using 99.9% percentage of interval and 99% confidence level, the UTL calculation will be more sensitive to the real variability of the data, and will more accurately capture the true, short term maximum emissions rate of a unit. UTL calculation could also then be compared to any single hour in the period after the change is made without resulting in as many false positives, i.e., those instances where the UTL is exceeded merely through the natural variability of a unit whose emissions has not in fact changed at all.¹⁰

With this possible corrections to the proposed UTL approach in mind, Southern Company used the three units and emissions data points discussed above and derived a UTL for the five-year period from each 24-hour and 168-hour period instead of from the top 10% of each 8760 hour period. As projected, this significantly reduced the number of scenarios in which the test would indicate an emissions increase occurred even if the unit precisely duplicated its baseline emissions levels exactly for the five years following a project.¹¹ Choosing a 24-hour UTL helps capture the maximum performance of a given unit, and, therefore, there is no need to

¹⁰ Selecting 24 hours of data would approximate a relative 0.002% false positive rate, while choosing a UTL based on 168 hourly points would approximate a relative false positive rate of 2.8%. These would seem to bound the range of reasonable choices for such a test. [UTL for Z derived from 24 points = effective tolerance of 99.99992%; $1 - 0.9999992^{24} = .002\%$; and, UTL for Z derived from 168 points = effective tolerance of 99.9828%; $1 - .999828^{168} = 2.8\%$]

¹¹ See Attachment D, comparing actual hourly emissions rate data against UTLs calculated based on 168 hour data sets. All the data, including low emissions data, is used to generate each UTL, not just the top 10%, so no sorting is required.

restrict the data to only the top10%. This avoids completely the question of sorting data by emissions or by heat input because all the data points are included.

The second correction would be limiting the number of future data points against which the UTL is compared to ensure a 99% confidence that a given unit would not have a false positive. Reducing the number of data points could best be accomplished in a manner that also addresses the manifest variability in the data. Specifically, instead deriving the UTL from single hourly rate data points, the UTL may be calculated over a year's worth of hourly rate data based on short term averages of that hourly data. Essentially, 52 weekly averages of the hourly emissions rate (after excluding startups, shutdowns, and malfunctions) would be used to calculate a 99.9% UTL for each 52 week period in the lookback period. Using weekly averages to calculate the UTL would then allow for a comparison against weekly averages of hourly emissions rates in the future. Importantly, this would still represent a test of maximum hourly emission *rates*, but the calculation would smooth the data to obtain a more representative view of the unit's operations and reduce the severity of the impact a change in data variability has on the test.¹² A UTL based on weekly averages in the manner described above could still result in 0.5% of units expecting UTL exceedances even if future emissions remain identical to past emissions,¹³ but this would significantly improve the viability of the UTL test.

Finally, a statistical analysis could be applied to post-project data to allow for a more appropriate comparison to the statistical analysis of the pre-project data. For example, a mean to mean comparison between high instances in the pre-project and post-project periods could be performed. A student t-test, as used in the current NSPS program, could be applied to the top 3

¹² See Attachment E, comparing actual hourly emission rate data averaged over 168 hours against UTLs calculated from rolling 52 week averages.

¹³ Again, this is approximate and illustrative in light of the lack of statistical independence among the emissions rates.

hours of data before and after a project to determine whether a statistically significant change in the mean maximum hourly emissions rate had occurred.

4. Backstopping False Positives

Regardless of which correction is used to minimize false positives, they will occur. In order to eliminate the internal inconsistency inherent in the UTL of showing increases where future data exactly mimics historic data, a backstop is required. The best and simplest method to achieve this is to automatically allow the same number of UTL exceedances in the future as occurred during the lookback period. In the idealized circumstance, EPA's proposal predicts 44 exceedences when the future precisely mimics the past. Because the proposed rule does not use normally-distributed data, many units have a much higher prevalence of exceedences. Accordingly, the final rule should provide that at least 0.5% of the post-change hours must exceed the UTL before an emissions increase has been identified. This would be set as a safe harbor level to ease the burden of implementing an already very complicated rule, but the rule must make clear, in order to make the test internally consistent, that each EGU can further exclude from its future data the any additional number of data points as lay above the calculated UTL during the lookback period.

VII. Miscellaneous Comments

In addition to the specific comments provided above with regard to each of the proposed options and alternatives, Southern Company would also like to offer the following additional comments on EPA's proposed hourly emissions test for EGUs.

A. Recordkeeping and Reporting

The SNPR specifically requests comment on EPA's proposal to rely on existing recordkeeping and reporting obligations to ensure compliance with the new EGU hourly

emissions test rule. 72 Fed. Reg. at 26,217. Southern Company fully supports EPA's efforts to avoid duplicative reporting, and agrees that sufficient recordkeeping and reporting requirements already exist to ensure state and federal regulatory authorities have the information they will need to implement and enforce the NSR program based on the new EGU hourly emission test.

B. Nationwide Coverage and Application to All Regulated NSR Pollutants

Southern Company would also like to express its support for the application of the new EGU hourly emission test to all EGUs throughout the country, and for all regulated NSR pollutants emitted from those facilities. Southern Company supports comprehensive application of the hourly test for the same reason it supports adoption of the NSPS test for the NSR program – a single, nationwide test for all units and all pollutants (and all programs) will both clarify and simplify the analysis of whether a project is expected to trigger new source permitting and regulatory requirements. A single test that maintains the same level of environmental protection, but at a fraction of the regulatory burden, is obviously superior. To avoid the unnecessary complication of the NSR emissions test through the adoption of multiple alternatives, Southern Company recommends the adoption of the hourly emission test for all EGUs and all pollutants.

VIII. Conclusion

As described in detail above, Southern Company generally supports EPA's efforts to adopt an hourly emissions test for EGUs, but requests EPA clarify how the causation aspect of the analysis will be incorporated into the proposed tests. Southern Company specifically supports EPA's preferred Option 1 and Alternative 5 because use of the NSPS test to determine NSR applicability will facilitate projects that are needed to maintain and improve the safety, reliability, and efficiency of the nation's power supply. Southern Company could also support a variation of Alternative 1 if the statistical approach in the proposal is corrected as outlined above.

Regardless of alternative, however, EPA's analysis makes clear that the adoption of an hourly emissions rate test for determining NSR applicability to EGUs will not result in any detrimental impact to the environment. Rather, Southern Company agrees with EPA's assertion that an hourly emissions rate test will maintain the environmental protections established by the Clean Air Act while minimizing the administrative burden on the regulated community, thus better serving the underlying policy of the NSR program.

Southern Company appreciates the opportunity to comment on EPA's supplemental proposal and urges EPA to adopt a final EGU hourly emission rate test as soon as possible.

Attachment A

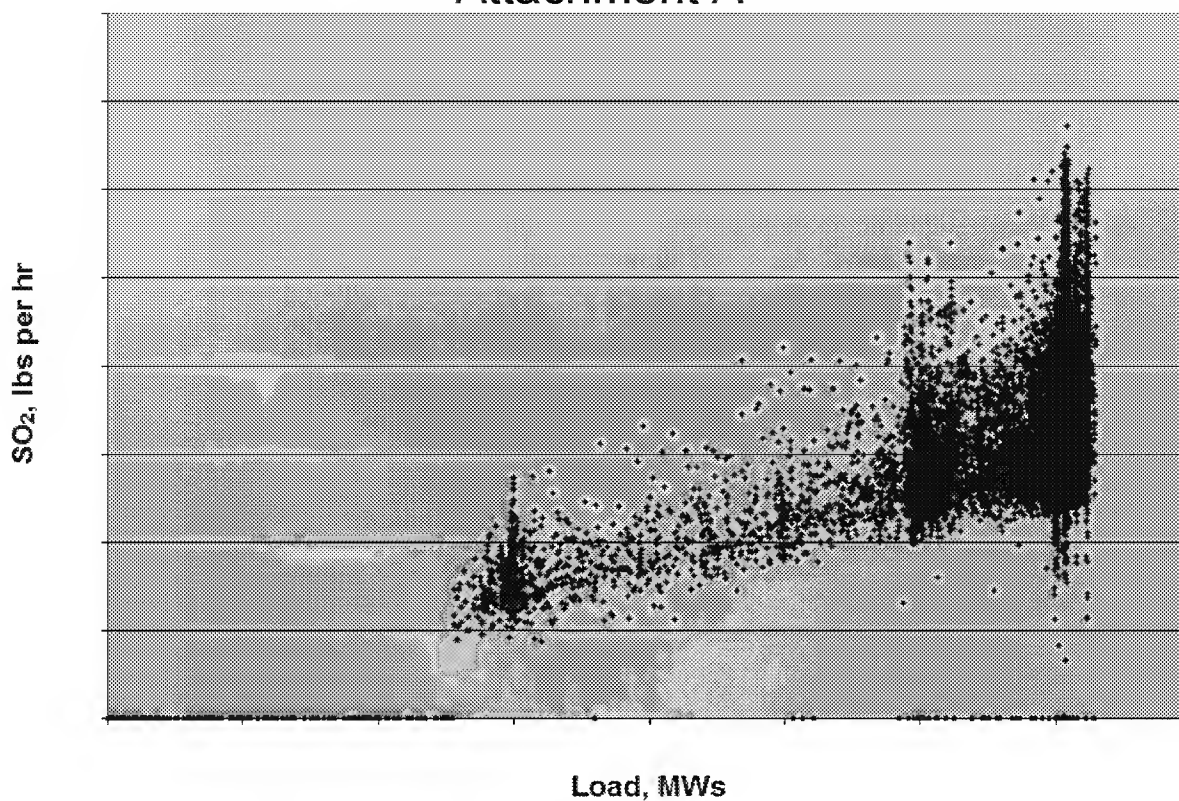


Figure A1. SO₂ emissions in lbs per hour as a function of unit load.

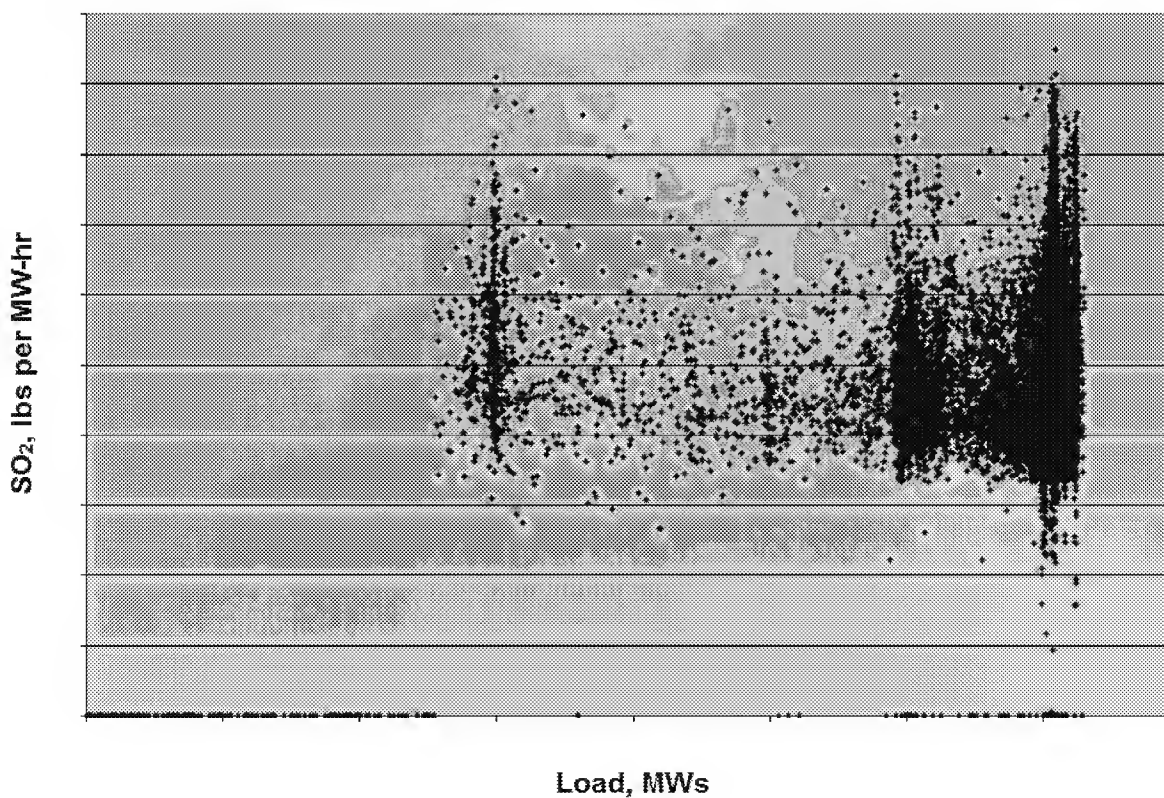


Figure A2. SO₂ emissions in lbs per MW-hour as a function of unit load, showing that mid-load output-based emissions are similar to full-load emissions.

Attachment B

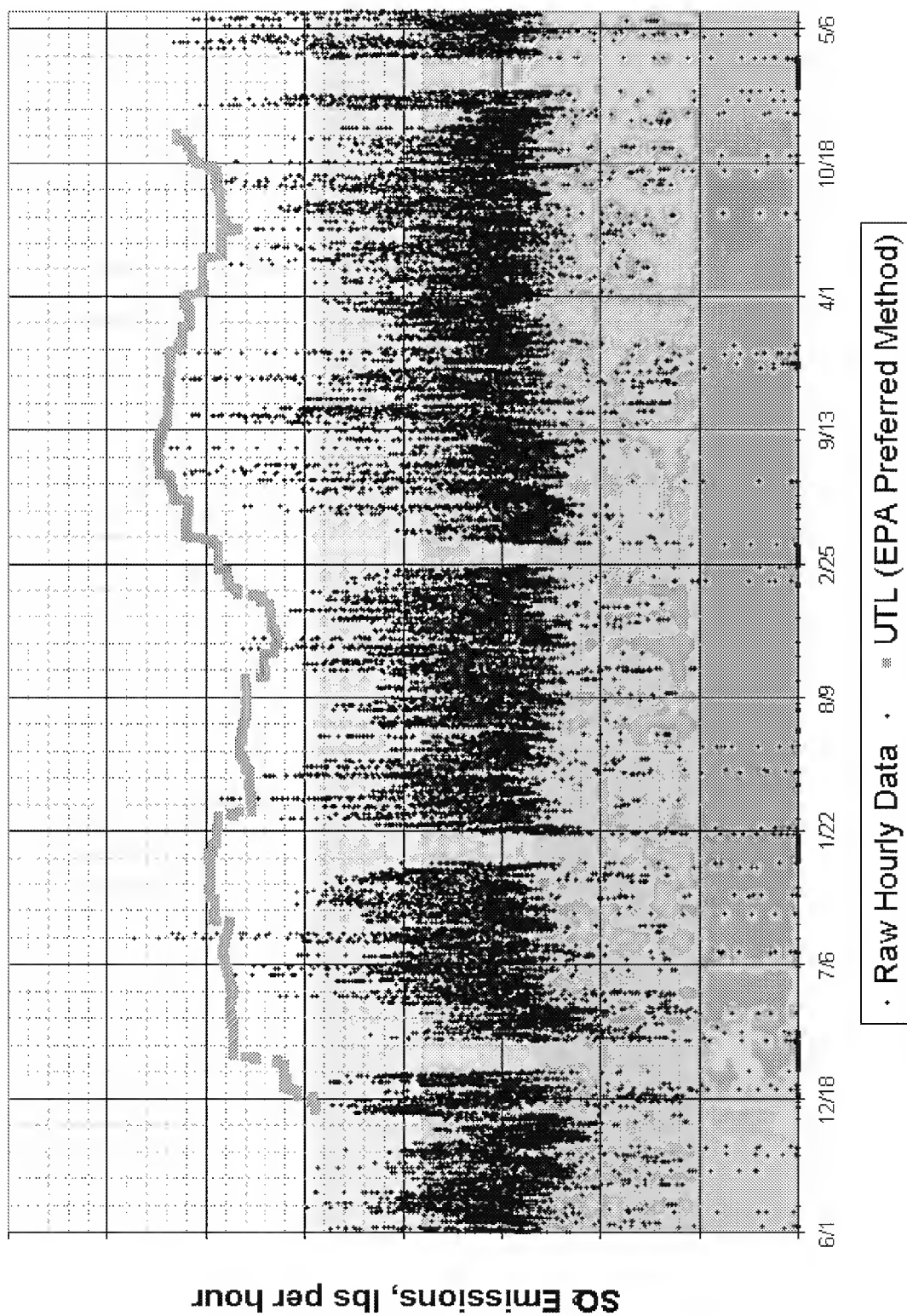


Figure B1. SO₂ emissions in lbs per hour for 5 years compared to the UTL calculated as the EPA method from the top 10% sorted by emissions rate.

Attachment C

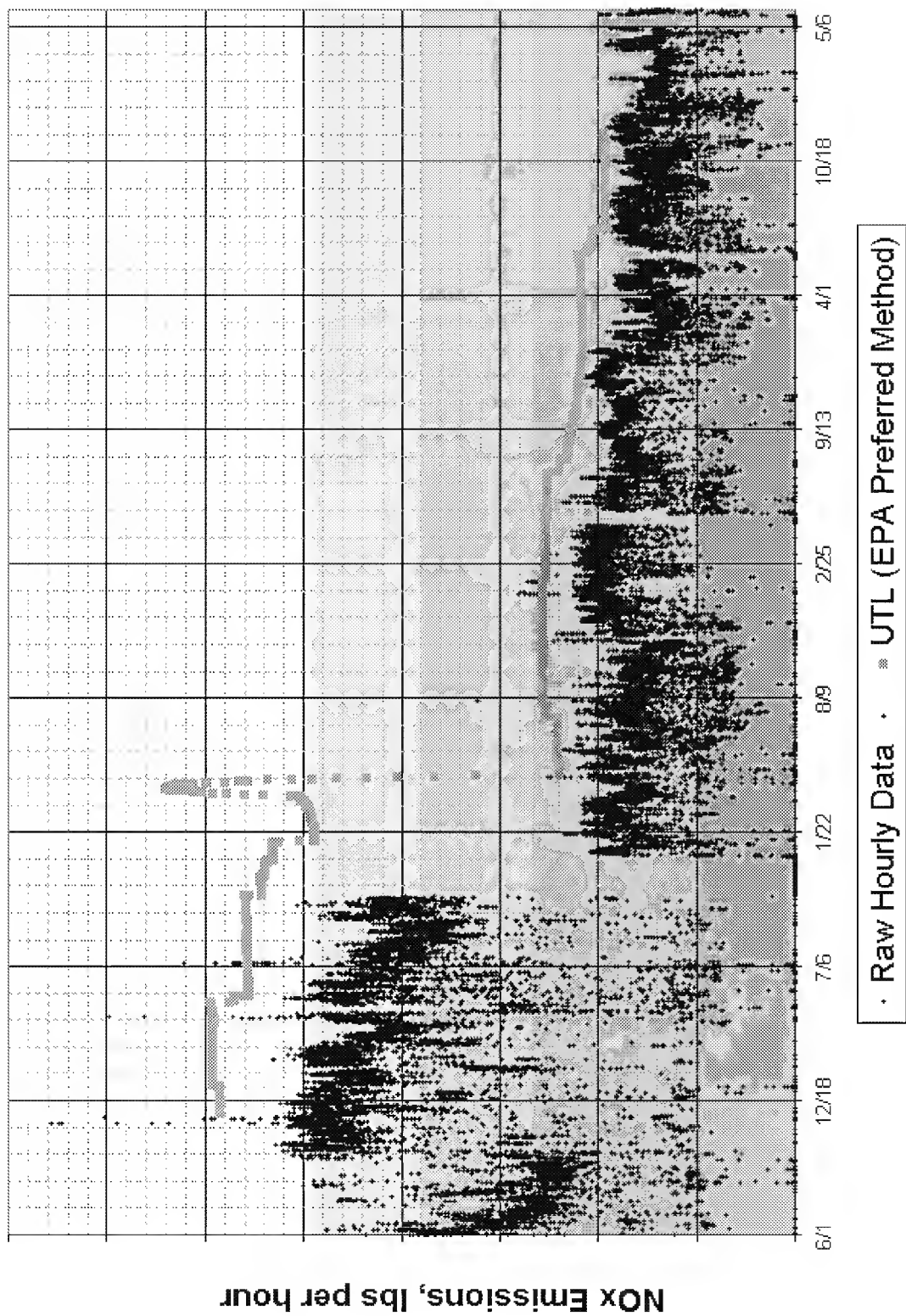


Figure C1. NOx emissions in lbs per hour for 5 years compared to the UTL calculated as the EPA method from the top 10% sorted by emissions rate.

Attachment D

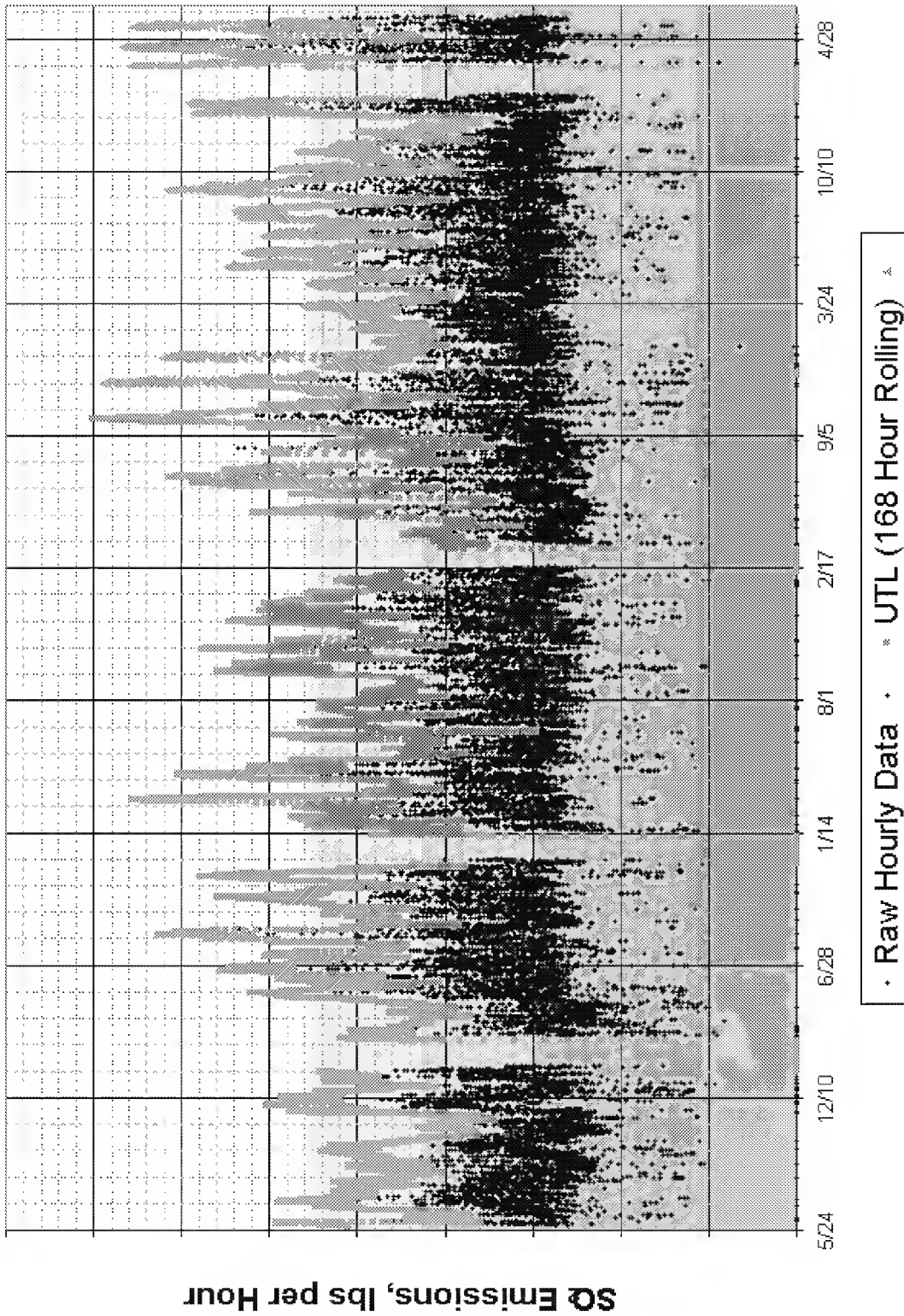


Figure D1. SO₂ emissions in lbs per hour for 5 years compared to the UTL calculated from contiguous 168 hours blocks using all the hourly data except malfunction, startup, and shutdown.

Attachment E

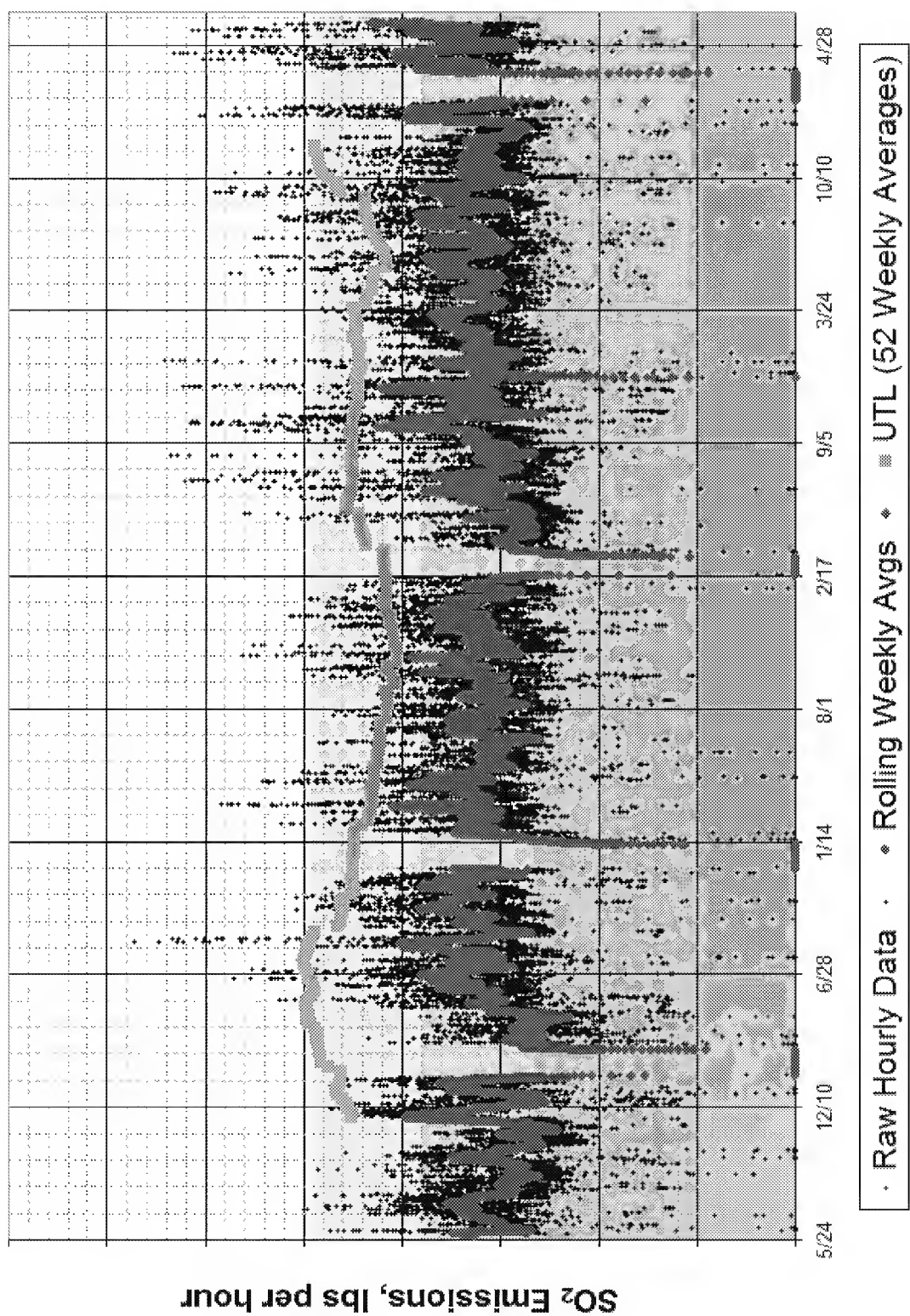


Figure E1. SO₂ emissions in lbs per hour for 5 years compared to the UTL calculated from a rolling year of 52 weekly averages of the hourly data. Also the rolling weekly averages are shown.



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August 8, 2007

**VIA ELECTRONIC FILING/HAND DELIVERY TO DOCKET CENTER/MAILING
TO RTP**

Environmental Protection Agency,
EPA Docket Center (EPA/DC)
Air and Radiation Docket
Mail Code 6102T
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Re: Docket ID No. EPA-HQ-0AR-2005-0163

Dear Sir or Madam:

Enclosed are the comments of the Utility Air Regulatory Group (“UARG”) on the Environmental Protection Agency’s (“EPA’s”) Supplemental Notice of Proposed Rulemaking for Prevention of Significant Deterioration and Nonattainment New Source Review: Emission Increases for Electric Generating Units; Proposed Rule, 72 Fed. Reg. 26202 (May 8, 2007).

Included with this electronic filing of the UARG comments are two attachments.

- Attachment 1 is a related technical report by UARG’s consultants, Lowell L. Smith and Michael C. Hein, *Analysis of the Upper Tolerance Limit Process Proposed by EPA for Determining the “Maximum Achieved Hourly Emissions Rate” for Electric Generating Units* (August 6, 2007). Because the background data for this report are too voluminous to transmit electronically, we have stored those data on a CD, which we are separately delivering to EPA’s Docket Center today (along with a hard copy of the UARG comments) and also to EPA’s Office of Air Quality Planning and Standards (“OAQPS”) in Research Triangle Park, North Carolina.
- Attachment 2 is a copy of the comments UARG filed in response to EPA’s October 2005 notice of proposed rulemaking on these issues.



Docket ID No. EPA-HQ-OAR-2005-0163
August 8, 2007
Page 2

If you have any questions, please call any of us. Thank you.

Sincerely,

A handwritten signature in cursive script that reads "Andrea Bear Field".

Andrea Bear Field
Makram Jaber
Craig S. Harrison
Maida O. Lerner

Enclosures

cc: Lisa Sutton, EPA OAQPS (with Enclosures, including CD)

**COMMENTS OF THE UTILITY AIR REGULATORY GROUP
ON THE
ENVIRONMENTAL PROTECTION AGENCY'S SUPPLEMENTAL
NOTICE OF PROPOSED RULEMAKING FOR PREVENTION OF
SIGNIFICANT DETERIORATION AND NONATTAINMENT NEW
SOURCE REVIEW: EMISSION INCREASES FOR ELECTRIC
GENERATING UNITS**

(MAY 8, 2007)

DOCKET EPA-HQ-OAR-2005-0163

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August 8, 2007

**COMMENTS OF THE UTILITY AIR REGULATORY GROUP
ON THE
ENVIRONMENTAL PROTECTION AGENCY’S SUPPLEMENTAL NOTICE
OF PROPOSED RULEMAKING FOR PREVENTION OF SIGNIFICANT
DETERIORATION AND NONATTAINMENT NEW SOURCE REVIEW:
EMISSION INCREASES FOR ELECTRIC GENERATING UNITS
(MAY 8, 2007)**

On May 8, 2007, the United States Environmental Protection Agency (“EPA” or “the Agency”) published a supplemental proposal to its October 2005 proposal to adopt a new emissions increase test under the New Source Review (“NSR”) program¹ of the Clean Air Act (“CAA”) for existing electric generating units (“EGUs”). *See* 72 Fed. Reg. 26202 . The October 2005 proposal announced that EPA was considering three “alternatives” for a revised emissions increase test for EGUs and discussed the legal and technical bases of EPA’s proposed action, but it did not provide specific regulatory language implementing any of the alternatives. *See* 70 Fed. Reg. 61081 (Oct. 20, 2005). UARG made a statement at a public hearing for that initial proposal and submitted written comments, which it incorporates and attaches herein.² EPA’s supplemental proposal lays out several options for the emissions increase test for EGUs and provides specific regulatory language for implementing some of these options.

¹ There are two new source review programs and thus two sets of regulations at issue in this rulemaking: the Prevention of Significant Deterioration (“PSD”) and the Nonattainment New Source Review (“NNSR”) rules (hereinafter, PSD and NNSR are collectively referred to as “NSR”)

² UARG’s comments, in addition to providing UARG’s views on the proposal, responded to certain wide-ranging objections to the proposal that were in the public record at the time. Because those objections will no doubt be repeated in this supplemental rulemaking, UARG respectfully submits that its original comments remain pertinent and are worth re-emphasizing in this rulemaking. Rather than repeating them, however, UARG has attached a copy of its earlier comments and respectfully directs EPA’s attention to them. *See* Attachment 2.

These are the comments of the Utility Air Regulatory Group (“UARG”) on EPA’s supplemental proposal. UARG is a voluntary, nonprofit group of electric generating companies and organizations and four national trade associations. UARG’s purpose is to participate on behalf of its members collectively in EPA’s rulemakings, in other CAA proceedings, and in related litigation matters that affect the interests of electric generators. Since 1977, UARG has participated in virtually all key CAA rulemakings affecting electric utility companies and in subsequent litigation related to those rulemakings. In particular, UARG has been an active participant in the rulemakings and litigation related to the Act’s NSR preconstruction permitting programs. For example, UARG was actively involved in the 1977-78 rulemakings to implement the NSR permitting requirements of the 1977 Clean Air Act Amendments, and UARG (participating under the names of its individual members) was the lead petitioner in the seminal NSR case, *Alabama Power Company, et al. v. Costle*, 636 F.2d 323 (D.C. Cir. 1979). UARG has also been a participant in subsequent NSR rulemakings and litigation, including EPA’s rulemakings to implement the *Alabama Power* decision and subsequent litigation (*Chemical Manufacturers Association v. EPA*, No. 79-1112 (D.C. Cir.)); the Seventh Circuit litigation concerning an NSR issue at an individual company (*Wisconsin Electric Power Co. v. Reilly*, 893 F.2d 901 (7th Cir. 1990)); the 1992 “WEPCo” rulemaking (57 Fed. Reg. 32314 (July 21, 1992)); the meetings of the Clean Air Act Advisory Committee’s New Source Review Subcommittee (the Subcommittee first met in the summer of 1992 and met frequently over the next four years to discuss ways to “simplify” or “reform” the NSR program); and the 2002 and 2003 EPA rulemakings to revise portions of the NSR program and subsequent litigation (*New York v. EPA*, 413 F.3d 3 (D.C. Cir. 2005), also known as “*New York I*”; and *New York v. EPA*, 443 F.3d 880 (D.C. Cir. 2006), also known as “*New York II*”).

In addition to UARG's having familiarity with the history of NSR regulations, UARG's individual members have practical, hands-on experience with the application of the NSR programs and with other CAA programs, including EPA's new source performance standards ("NSPS") program under CAA §111.

Based on this extensive knowledge of the NSR program, UARG members strongly support EPA's proposal to adopt an hourly emissions increase test as a threshold requirement for what is a "modification" under the NSR program and to retain the source-wide significant net annual emissions increase requirements of the current NSR rules. In addition, UARG supports EPA's option that would adopt for the NSR program the same "maximum achievable" hourly emissions test that has been implemented successfully under the NSPS rules for more than a decade. If EPA ultimately decides to adopt an "achieved" test, however, UARG urges the Agency to account explicitly for the statutory requirement that there be a causal link between a change and any emissions increase and to establish the analytical approaches that may be used for implementing such a test.

I. EPA'S PLAN TO ADOPT AN HOURLY EMISSIONS RATE INCREASE TEST IS FULLY CONSISTENT WITH THE CLEAN AIR ACT.

EPA's proposed rule offers several alternative emissions tests for determining whether an EGU has undergone a "modification" under the NSR program. A common feature of all these tests is EPA's proposal to measure emission increases in hourly units for NSR applicability purposes. For the reasons set forth below, UARG supports EPA's use of hourly-based tests as a permissible and reasonable means for implementing the NSR provisions of the Clean Air Act. In addition, UARG agrees with EPA's assessment that the proposed rule would promote the safety, reliability, and efficiency of EGUs, and that it strikes an appropriate balance between the need for environmental protection and economic growth. *See* 72 Fed. Reg. at 26204.

A. The Clean Air Act Does Not Specify How Emission Increases Should Be Measured, Thus Leaving EPA With Discretion To Adopt An Hourly-Based Test.

Congress did not specify how emission increases were to be calculated under the NSR program. Under the NSR framework, whether an existing source should be subject to NSR requirements turns on whether the source has been “modified” as defined in § 111(a)(4) of the Act. Critically, although that definition of modification refers to emission increases, it provides absolutely no guidance as to how such emission increases should be measured. Specifically, § 111(a)(4) defines the term “modification” as “any physical change in, or change in the method of operation of, a stationary source which increases the amount of any air pollutant emitted by such source or which results in the emission of any air pollutant not previously emitted.” 42 U.S.C. § 7411(a)(4). Given that § 111(a)(4) refers to “emission increases” without any instruction as to how those changes in emissions should be measured, well-established principles of administrative law dictate that the technical task of defining an emission increase is left to EPA’s reasonable discretion. *See Chevron v. Natural Resources Defense Council*, 467 U.S. 837, 842-43 (1984) (stating that if a statute “is silent or ambiguous with respect to the specific issue, the question for the court is whether the agency’s answer is based on a permissible construction of the statute”).

Indeed, recent court rulings confirm that the Clean Air Act does not specify how increases in emissions should be measured for purposes of § 111(a)(4).³ For example, in *New*

³ Some commenters have previously cited the Seventh Circuit’s decision in *Wisconsin Electric Power Company v. Reilly*, 893 F.2d 901 (7th Cir. 1990) (“*WEPCo*”), for the proposition that the PSD program requires an annual measurement of emission increases. These commenters, however, inappropriately take out of context a single sentence from *WEPCo*, stating that “PSD is concerned with changes in *total annual emissions*, expressed in tons per year,” *id.* at 915 (emphasis in original), and argue that this is a categorical statement of the requirements of the *statutory* PSD program. Nothing could be further from the truth. The *WEPCo* decision addressed the regulations implementing the PSD program, and this quote merely acknowledged

(continued...)

York I, the D.C. Circuit rejected challenges to an EPA rule that allowed sources to measure emission increases by comparing post-change emissions to certain emissions averaged over a portion of the ten-year period leading up to the change. 413 F.3d at 21-27. In holding that EPA's ten-year "look back" period was a permissible way of measuring emission increases under § 111(a)(4), the D.C. Circuit explicitly acknowledged: "In enacting the NSR program, Congress did not specify how to calculate 'increases' in emissions, leaving EPA to fill that gap while balancing the economic and environmental goals of the statute." *Id.* at 27. The D.C. Circuit re-confirmed the inherent ambiguity in § 111(a)(4) again in *New York II*, stating that "Congress's use of the word 'increases' necessitated further definition regarding *rate* and *measurement* for the term to have any contextual meaning." 443 F.3d at 888-89 (emphasis added). That is precisely what this rulemaking is about: the Agency's "further definition regarding rate and measurement" for the term "increases" as set forth in the statutory definition of modification.

Finally, most recently in *Environmental Defense v. Duke Energy Corporation*, 127 S.Ct. 1423 (2007), the Supreme Court, after rejecting the argument that EPA was compelled to adopt the same hourly test for NSR that the Agency had previously adopted for NSPS, noted that EPA

the unremarkable (and never disputed) fact that the PSD rules, at the time, defined "major modification" in terms of annual emissions, while the NSPS rules defined "modification" in terms of hourly emissions. This quote in no way addresses the underlying statutory requirements for PSD or restricts EPA's discretion to interpret the statutory term "increase" in § 111(a)(4) differently than it did in the regulations then before the Seventh Circuit in *WEPCo*. Even if the *WEPCo* court were purporting to interpret the statute in that sentence (which it was not), that interpretation does not limit the Agency's discretion, especially given that, as the D.C. Circuit plainly acknowledged in *New York I* -- a decision that directly addressed § 111(a)(4) -- "Congress did not specify how to calculate 'increases' in emissions," 413 F.3d at 27. *See National Cable & Telecomm. Ass'n v. Brand X Internet Servs.*, 545 U.S. 967, 980 (2005) (wherein the Court explained that *Chevron* requires a court to accept an agency's reasonable construction of a statute to fill a statutory gap "even if the agency's construction differs from what the court believes is the best statutory interpretation").

retained “customary agency discretion” to adopt *any* test that falls “within the limits of what is reasonable, *as set by the Act’s common definition*” in § 111(a)(4). *Id.* at 1433-34 (emphasis added). An hourly rate test falls within such a reasonable limit given that the Act does “not specify how to calculate ‘increases’ in emissions.” *New York I*, 413 F.3d at 27. Thus, in light of the obvious ambiguity in the Act and the case law recognizing this ambiguity, EPA has correctly recognized in the preamble of the proposed rule that its various proposed hourly rate tests are an appropriate exercise of its discretion.

B. No Other Provisions of the Act Compel EPA To Adopt A Yearly Test Or Any Other Type of Emission Increase Test.

In response to the 2005 proposed rule, some commenters argued that, because some provisions of the Act refer to emission measurements in yearly increments, EPA is compelled to measure emission increases for purposes of § 111(a)(4) in terms of yearly increments. These commenters typically admitted that § 111(a)(4) is silent as to how to measure emission increases, but cited other sections of the Act – namely, §§ 169(1) and 165(b) – for the proposition that EPA is prohibited from relying on an hourly rate test. This argument contains numerous flaws.

First, nothing in §§ 169(1) and 165(b) indicates that these provisions govern how an emission increase must be calculated under § 111(a)(4). Section 169(1) defines the term “major emitting facility” as meaning a source that emits or has the potential to emit at certain tons per year threshold of pollutant. Section 165(b) provides an exemption from certain required air quality analyses when, after modification, a source will have allowable emissions of less than fifty tons per year. These provisions address relatively narrow and *different* applicability issues than § 111(a)(4), and they certainly do not force upon EPA a certain test for measuring emission increases under § 111(a)(4). Simply because Congress spoke in specific terms regarding units of measurement in some NSR provisions does not establish that it intended (without making its

intentions clear) to force EPA into using those same units with respect to all NSR issues. Quite the contrary, it demonstrates that Congress knew how to specify a unit of measurement when it wanted to, and it chose not to do so in defining “modification.”

For these other provisions to have the impact on § 111(a)(4) that some have suggested, that impact must be explicit. In the past, commenters have argued that these provisions are sufficiently connected because they are all related to NSR. Such a connection is too general, however, to read into § 111(a)(4) a requirement that EPA must adopt a specific type of test for measuring emission increases. Indeed if, as the Supreme Court and the D.C. Circuit have held, even the *same* statutory definition can be given different meanings in different parts of the statute, then surely the fact that one provision specifies a particular unit of measurement for one purpose does not mean that another provision of the statute must be read to incorporate, *sub silencio*, that same unit of measurement.

Moreover, the *Duke Energy* decision’s analysis of the 1980 PSD regulations provides an example of the kind of more explicit connection that would be required to impart into one provision of a statute or regulation the rate specified elsewhere in that statute or regulation. That explicit connection exists when the definitional sections of the statute or rule inexorably lead to that conclusion. As the Court noted in *Duke Energy*, the 1980 PSD regulation, like § 111(a)(4), defined a modification as “a physical or operational change that ‘would result in a significant net emissions increase,’” but did not “on its face” define how that increase should be measured. 127 S.Ct. at 1434 (quoting 40 CFR § 51.166(b)(2)(i)). Unlike § 111(a)(4)’s definition of “modification,” however, the 1980 PSD regulations defined the component terms of “modification” to require an annual measurement for emissions. Specifically, the 1980 PSD regulations defined the term “major modification” as “any physical change in or change in the

method of operation of a major stationary source that would result in *a significant net emissions increase* of any pollutant subject to regulation under the Act.” See 40 C.F.R. § 51.166(b)(2)(i) (1987) (emphasis added). Critically, and as the Court noted in *Duke Energy*, “further regulations in turn addressed various elements of this definition.” 127 S.Ct. at 1429. Indeed, the 1980 regulations defined the term “‘net emission increase’” in part as any increase in “‘actual emissions,’” a term that itself was defined as “‘equal to the average rate, *in tons per year*, at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation.” See *id.* (quoting 40 C.F.R. §§ 51.166(b)(3), (21)(ii)) (emphasis added). And, the Court also noted, “the term ‘significant’ was defined as ‘a rate of emissions that would equal or exceed’ one or another enumerated threshold, each expressed in ‘tons per year.’” *Id.* (quoting 40 C.F.R. § 51.166(b)(23)(i)).

Thus, the definition of the term “modification” in the 1980 PSD regulations is built on component terms which in turn directly and expressly incorporated an annual emissions rate. In sharp contrast, the definition of “modification” found at § 111(a)(4) of the Act contains no component terms that in turn are defined using annual emission rates. Instead, and also in contrast to the 1980 PSD rules at issue in *Duke Energy*, the component terms of § 111(a)(4) lack definition. Had Congress used defined terms in § 111(a)(4) that could similarly be traced back to definitions that rely on yearly emission measurements, perhaps there would be grounds for an argument that other provisions of the Act preclude EPA from adopting an hourly rate test. Absent such a direct connection, the fact that other, unconnected sections of the Act refer to annual emission measurements cannot override the well-established principles of administrative law that provide EPA with discretion to interpret undefined statutory terms reasonably. See

Chevron, 467 U.S. at 844 (“considerable weight should be accorded to an executive department’s construction of a statutory scheme it is entrusted to administer”).

Finally, the definition of modification in § 111(a)(4) *pre-dates* all NSR provisions, including §§ 169(1) and 165(b), thus undermining any argument that these other NSR provisions somehow compel EPA to establish an annual emissions test for the pre-existing § 111(a)(4) modification definition. Congress established § 111(a)(4)’s definition of modification in 1970 as part of its enactment of NSPS. In the 1970 Act, there were no provisions that defined any emission thresholds or increases, whether in terms of hourly or annual rates. Thus, it seems axiomatic that EPA was free to adopt either such rate (or any other temporal measure for that matter) in interpreting the 1970 Act. When it established the NSR program in 1977, Congress subjected to PSD newly constructed or modified sources. *See* 42 U.S.C. § 7479(2)(C). Rather than providing a definition of “modification” unique for the NSR program, Congress simply referred back to the pre-existing NSPS definition. *See id.* (stating that the term construction includes the modification of any source or facility “as defined in [S]ection 7411(a)”). To the extent that any meaning attaches to Congress’ simultaneous borrowing of the NSPS modification definition while enacting unrelated NSR provisions referencing yearly emissions, these actions show that Congress knew how to impose yearly emission measurement requirements and unquestionably refrained from doing so with respect to emission increases that trigger NSR.

Congress’ decision to borrow the existing NSPS definition of “modification” at the time it enacted the NSR program is also noteworthy in that (as described in more detail below) the NSPS definition had an already-established body of regulations interpreting its meaning, including regulations adopting an hourly-rate test. Had it intended to bind EPA to an annual emission test in enacting NSR as some have suggested, it would have made no sense for

Congress to borrow a definition from another part of the statute that did not explicitly require an annual test and had already been reasonably interpreted by EPA as allowing an hourly-based test. Although *Duke* and *New York I* rejected arguments that Congress' borrowing of the NSPS definition included a borrowing of the then-existing regulatory gloss underlying that definition, these decisions do not alter the factual circumstances surrounding the enactment of the NSR program. It is undisputed that Congress could have included a NSR-specific definition of the term "modification" that, like §§ 169(1) and 165(b), explicitly referred to annual emission increases. Congress did not take this route, however, and instead elected to incorporate a pre-existing definition of modification that is silent as to measurement rate and, both then and now, leaves EPA free to adopt an hourly rate test.

C. EPA Has Reasonably Relied On Hourly-Based Emission Rate Tests For More Than Thirty Years.

EPA has relied on an hourly-rate approach to measuring emission increases since 1975. A brief review of the regulatory history demonstrates that EPA and the regulated community have relied upon these tests for decades as reasonable means for assessing emission increases under the Clean Air Act.

Congress set the foundation for the hourly rate test in 1970 by enacting a definition of the term "modification" in § 111(a)(4) that, as discussed above, was silent as to how to measure emission increases. At the same time it enacted this definition, Congress also directed EPA to promulgate more detailed regulations governing the NSPS. Under these regulations, issued in 1971, EPA defined "modification" in substantially the same way as § 111(a)(4):

Modification means any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted into the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) into the atmosphere not previously emitted.

40 C.F.R. § 60.2; 36 Fed. Reg. 24876 (1971).

In 1974, however, EPA initiated a new rulemaking that would eventually culminate in the 1975 revisions to the NSPS rules. 39 Fed. Reg. 36946 (Oct. 15, 1974). In that proposal, EPA explained that the term “modification” as “defined in the Act as well as in 40 C.F.R. § 60.2(h)” included “several terms and phrases” that were “not fully understood *outside the agency*.” *Id.* (emphasis added). The purpose of the proposed revisions to the NSPS rules, EPA said, was to “resolve any confusion that may exist as to what constitutes a modification” by clarifying the “terms and phrases” in 40 C.F.R. § 60.2(h) that were not “fully” understood by those “outside” the Agency. *Id.* In particular, EPA explained at considerable length in the 1974 preamble the rationale behind proposed paragraph (b) of a new section defining modification, 40 C.F.R. § 60.14, in which EPA explicitly defined emissions increase in terms of “kg/hr,” *i.e.*, an hourly rate. That provision was meant to “clarify the phrase in the definition of modification ‘increases the amount of any air pollutant.’” *Id.* In 1975, EPA adopted the proposed provision without change; under the NSPS rules, as adopted in 1975 and as they stand today, “Emission rate shall be expressed as kg/hr of any pollutant discharged into the atmosphere” 40 C.F.R. § 60.14(a), (b); 40 Fed. Reg. 58416 (1975).⁴

In short, since the very inception of the NSPS program, EPA adopted and applied an hourly emissions increase test to implement the statutory definition of “modification” found at

⁴ The Supreme Court, quoting the D.C. Circuit, stated in *Duke Energy*: “[N]either the 1975 regulation nor its preamble explained why EPA found it necessary to offer these two separate glosses [in 40 C.F.R. § 60.2 and 60.14] on ‘modification.’” 127 S.Ct. at 1428 n.1 (quoting *New York I*, 413 F.3d at 11-12). That statement is literally true but certainly does not support either curt’s conclusion that EPA’s rules have in them, without explanation, “two separate glosses” of what is an emissions increase for a modification. That is because these courts overlooked the unambiguous regulatory history discussed above (and in EPA’s October 2005 proposal, *see* 70 Fed. Reg. at 61088 n.24), where EPA discussed the very issue in the *proposal* for the 1975 rules.

CAA § 111(a)(4). That test has been explicit in the NSPS rules since 1975, and the Agency specifically explained that it was intended in the 1971 regulations.⁵ The 1975 NSPS rules were challenged in *ASARCO, Inc. v. EPA*, 578 F.2d 319 (D.C. Cir. 1978), and while that court struck down portions of them, it never questioned the propriety of EPA's hourly emissions increase test. In *New York I*, the petitioners challenged EPA's adoption in 1992 of a provision in the NSPS regulation setting a five-year baseline for the NSPS maximum achievable hourly test. The D.C. Circuit upheld that provision, and also did not question the maximum achievable hourly emissions increase test. *See* 413 F.3d at 27.

Thus, when Congress enacted NSR in 1977 and adopted the NSPS modification definition for NSR, the hourly-based emission test was well-established. To be sure, the Supreme Court and the D.C. Circuit have held this fact alone does not demonstrate that Congress intended to incorporate the hourly rate test in the statute. By the same token, however, by adopting the pre-existing statutory definition of "modification" for NSR, clearly Congress expressed no intent to *preclude* EPA from adopting in NSR rules further defining § 111(a)(4) "modification" the same emissions increase test that EPA had already reasonably adopted in the NSPS rules interpreting "the Act's common definition." *See Duke Energy*, 127 S.Ct. at 1434.

To the contrary, when Congress enacted NSR programs in 1977, it effectively enacted, with certain specific revisions, the preconstruction review and permitting program that EPA had earlier established in the PSD rules promulgated in 1974. *See* note 6, *supra*. (At the least,

⁵ In 1974, in response to a court injunction, EPA promulgated the PSD program for new and modified stationary sources. 39 Fed. Reg. 42510 (1974). As in the then-current 1971 NSPS rules, "modification" and "modified source" were also defined in the 1974 PSD rules to require an increase in "emission rate" and contained the same exclusions. EPA explicitly specified that these definitions were meant to be "consistent with the definition used in Part 60," *i.e.* consistent with the NSPS regulations. 39 Fed. Reg. 42513 (1974). In this pre-1977 PSD regulatory program, EPA calculated emissions increases on an hourly emissions rate basis.

Congress nowhere indicated any disapproval of the regulatory definition of “modification” in the 1974 PSD rules, which was the same as NSPS.) As identified in CAA § 168(b), certain of those specific revisions were made immediately effective by Congress, while other changes to the 1974 PSD rules were to be implemented through EPA or state rulemakings. *See* CAA § 161. The balance of the 1974 PSD program was left intact, including the definition of “modification” (under which, again, EPA calculated emissions increases on an hourly emissions rate basis). Pursuant to CAA § 168(a), these provisions continued to govern the application of the new statutory NSR programs without the need for further rulemaking. Thus, Congress made it clear that, for purpose of the new NSR programs, EPA had discretion to continue to interpret CAA § 111(a)(4)’s definition of “modification” as it had under the 1974 rules.⁶

Moreover, the hourly emissions increase test has been in the NSPS rules for many years. EPA first applied that same test under the 1974 PSD rules, and that test remained in effect by operation of law (*see* CAA § 168(a)) until EPA adopted a different interpretation of “increases” in the 1978 NSR rules. *See* 43 Fed. Reg. 26388 (June 19, 1978) (adopting an annual “potential emissions” increase test). The “potential emissions” increase test was not challenged in the *Alabama Power* case, though other aspects of the 1978 rules were. EPA then changed the emissions increase test under the NSR rules again, to an annual “actual emissions” test, in the 1980 rules. And that test has undergone changes, most notably in 1992 and 2002 (both were

⁶ Nothing in *Duke Energy* is to the contrary. There, the Court observed that CAA § 168(a) provided that pre-existing rules were to remain in effect “[u]ntil such time as an applicable implementation plan is in effect,” a “temporary measure” that did not impose any “restriction on EPA’s authority to interpret the statutory PSD provisions reasonably in a manner that departs from the 1974 regulations.” *See Duke Energy*, 127 S.Ct. at 1434 n.6. Nowhere did the Court suggest, however, that the 1977 CAA Amendments worked to strip from EPA its discretionary authority to continue to define “modification” for purposes of the statutory NSR programs in a manner that was consistent with the definition the Agency had adopted under the 1974 rules.

reviewed in *New York I*). As the Supreme Court has explained, the very fact that EPA has adopted different interpretations of a single term under different provisions of the same statute and, indeed, under the same provision of a statute only goes to demonstrate further the broad discretion that Congress left to the Agency when it remained silent on some aspect of that term. *See Chevron*, 467 U.S. at 864 (“[T]he fact that the agency has adopted different definitions in different contexts adds force to the argument that the definition itself is flexible, particularly since Congress has never indicated any disapproval of a flexible reading of the statute.”).

D. The Proposed Hourly Emissions Tests Are Based on Actual Emissions.

The proposed hourly-based emission tests are based on actual emissions, and thus they are consistent with *New York I*, which read § 111(a)(4) as defining emission increases in terms of “actual emissions.” 413 F.3d at 39 (rejecting EPA’s proposed clean unit provision that would have measured emissions increases in terms of allowable emissions). Significantly, the D.C. Circuit’s opinion did not require EPA to adopt a particular rate for measuring those emissions -- rather, as discussed above, the D.C. Circuit explicitly acknowledged EPA’s discretion in defining rate -- and merely stands for the proposition that EPA must measure some unit of “actual emissions” in establishing an emissions increase test.

The “achievable” emissions increase test, which is the same as currently in NSPS, is a test based on “actual emissions.” *See* 72 Fed. Reg. at 26219; *see also* 39 Fed. Reg. 36946, 36946 (Oct. 15, 1974) (explaining that under the then proposed NSPS test, “for an existing facility to undergo a modification there must be an increase in actual emissions”). This is because, as EPA explained in the 2005 proposal, “The maximum achievable hourly emissions test measures what a source has been *actually* able to emit based on physical and operating capacity *during a representative period prior to the change*.” 70 Fed. Reg. at 61091 (emphasis added). In other words, unlike a test based on “allowable” or “potential” emissions, as these terms are defined in

the NSR rules, the maximum achievable hourly emissions test as implemented in NSPS and proposed here is *not* a theoretical maximum capability test that, in reality, may or may not be reasonably achievable under representative conditions. Indeed, the NSPS rules make clear, unless the use of emissions factors (and engineering analysis) “demonstrates that the emission level resulting from the physical or operational change will either clearly increase or clearly not increase,” *actual* testing must be used to evaluate the emissions rate of the unit. *See* 40 C.F.R. § 60.14(b). That *actual* testing must be conducted under the *same conditions* before and after the change, so as to isolate the effect, if any, of the change itself on the *actual* emissions rate of the unit under similar conditions. *Id.*

The “achieved” emission increase alternatives proposed by EPA also are plainly based on “actual emissions.” They require a comparison of the hourly rate actually achieved during the baseline period to the rate projected to be actually achieved after the project. Simply because EPA’s proposed alternatives rely on hourly units of measurement, as opposed to some other increment, does not preclude these tests from being ones that measure “actual emissions.” A test that compares an hour time period before a change to an hour time period after a change is just as much of a measure of “actual emissions” as a yearly-based test or any other time increment that EPA could have utilized.

Nevertheless, some commenters have previously claimed an hourly rate test is *per se* inconsistent with the Clean Air Act based on an overbroad reading of *New York I*. Specifically, these commenters have argued that an hourly rate test does not measure “actual emissions” because, essentially, “actual emissions” should be measured in annual increments. There is no support for the claim that actual emissions can be measured only in yearly increments. Neither *New York I* nor the Act itself defines actual emissions in these terms. In fact, *New York I*

undermines any argument that “actual emissions” must be measured in yearly (or any other specific) increments. In that case, petitioners challenged an NSR rule that defined emission increases by comparing post-change emissions to a pre-change baseline defined as “any consecutive 24-month period selected by the [source] within the 10-year period immediately preceding [the change].” *New York I*, 413 F.3d at 22 (quoting the definition of “baseline actual emissions” codified at 40 C.F.R. § 52.21(b)(48)(ii)(c)). The petitioners argued that this ten-year baseline window failed to capture real emission increases, which they reasoned had to be based on a comparison between emissions immediately before the change and emissions immediately thereafter. *Id.* at 22-23. In simple terms, the petitioners in *New York I* objected to EPA’s temporal framework for measuring emission increases and argued that their own offered timeframe was mandated under § 111(a)(4) of the Act. In rejecting the petitioners’ arguments, the court noted that the term “increases” did not set any such temporal boundaries, and upheld EPA’s reasonable interpretation of § 111(a)(4)’s emission increase concept. *Id.* at 23. Accordingly, rather than binding EPA to measure so-called “actual emissions” solely in terms of annual emissions, *New York I* specifically rejected placing a temporal limit on EPA’s reasonable discretion.

Another, closely related argument that some commenters make is that an hourly test is inconsistent with *New York I*’s reading of the Act because that test would allow, without triggering NSR, *some* “actual emission increase,” namely if “actual emissions” are averaged on a yearly basis. According to this argument, the hourly test is unlawful because the Act precludes *any* increase in “actual emissions.” That reasoning, however, was squarely rejected by the D.C. Circuit, when it upheld EPA’s choice of a 10-year baseline for NSR and the NSPS hourly emissions increase test for EGUs promulgated in 1992. Said the court:

[The Petitioners'] contention that the ten-year lookback period "administratively excise[s] the statutory word 'any' by excluding *some* emissions-increasing changes" from NSR, [Pets' Br.] at 13, is misplaced because the 2002 rule redefines the baseline such that 'any' change that increases emissions beyond the redefined baseline still triggers NSR. Environmental petitioners' similar contention that the 1992 rule violates the statutory term "any" by excluding some emissions-increasing changes from NSPS fails for the same reason.

New York I, 413 F.3d at 27. Here, EPA has proposed to "re-define" the baseline for "emissions increase" under NSR. As the D.C. Circuit held in *New York I*, this is comfortably within EPA's discretion under the statute.

In addition, the commenters' argument proves too much and, taken to its logical conclusion, is absurd. Any emissions increase test must be based on the operation of the unit during a particular period of time, whether that period is an hour, a day, a month, a year, a decade, etc. According to the commenters, an hourly emissions test allows some increases based on a yearly averaging period. But by the same token, a test based on the highest yearly average emissions during a given baseline (*e.g.*, 10 or 5 years, as is the case in the current NSR rules) would also allow "some increases" based on a longer averaging period of, say, 2 years, 5 years, a decade, etc. In fact, that test also would allow increases on a short-time basis, *e.g.*, hourly or monthly, so long as the annual emissions do not increase. If this logic was allowed to dictate the test EPA employs, EPA would never be able to adopt a suitable test, because whatever period EPA might use as the basis for calculating "actual emissions" would, purportedly, not capture "some" emissions increases averaged over a shorter or longer period.

Rather than reading the "actual emission" requirement in this seemingly absurd manner so as to preclude an emission tests based on hourly measurements, this requirement must be understood in the context of the opinion that established it and the plain language of the Clean Air Act itself. Specifically, in holding that § 111(a)(4) requires emission increases to be

measured in terms of “actual emissions,” the *New York I* court was not rejecting an hourly rate test. Rather, the *New York I* court was rejecting a proposal to exempt from NSR certain sources that agreed to install state-of-the-art pollution control technology so long as *allowable* emissions did not increase. 413 F.3d at 38-40. Thus, the choice faced in *New York I* was not between hourly or annual emission tests, but between a test based on theoretical, allowable emissions and one based on “actual emissions.” Given the issue at hand, *New York I*’s reference to “actual emissions” provides no basis for concluding an hourly-based test fails to capture such emissions. The Act also does not support such a conclusion, as it speaks in terms of emission increases without specifying how to calculate those increases. *Id.* at 27 (“In enacting the NSR program, Congress did not specify how to calculate ‘increases’ in emissions, leaving EPA to fill in that gap . . .”).

Quite simply, an increase in “actual emissions” can occur within any time increment, whether that increment is, for example, an hour, a day, a year, or a decade. Because Congress did not specify in § 111(a)(4) what increments EPA should employ in measuring emission increases, it left to EPA’s reasonable judgment what increment should be used. EPA has reasonably exercised its expertise in proposing hourly-rate based tests in this supplemental rulemaking.

II. RESPONSES TO SPECIFIC QUESTIONS RAISED IN EPA’S NOTICE

EPA’s supplemental proposal requests comment on several alternatives for, and specific aspects of, the Agency’s plans to implement an hourly emissions rate increase test for use in determining if projects at EGUs will trigger application of the NSR permitting program. The following are UARG’s comments on key aspects of EPA’s plans to implement an hourly emissions rate increase test.

A. Retention of the “Significant Net Emissions Increase Test”

The supplemental proposal sets forth two basic regulatory options. Option 1, which is EPA’s preferred option, in a nutshell, would base NSR applicability on both (1) a unit-level hourly emissions increase test and (2) the source-wide “significant net emissions increase test” currently in the NSR rules. A change at an EGU must result in both to trigger NSR. Option 2 would eliminate the current source-wide significant net emissions increase test and would base NSR applicability solely on a unit-level hourly emissions increase test. Option 2 would thus eliminate the significance thresholds and the opportunity for netting, *i.e.*, offsetting an increase in emissions at a source with a decrease elsewhere at the source so that there is no “net” emissions increase.

As UARG stated in its comments on the 2005 proposal, UARG strongly supports the retention of the “significant net emissions increase test” as a second step in the NSR applicability inquiry. UARG therefore supports EPA’s preferred option, Option 1. That option has several advantages. First, it minimizes the overall regulatory changes in this rulemaking. Second, and more importantly, both the “significance” and “netting” concepts are long-standing and have been recognized as implementing sound policy; there is no evidence anywhere in the record that even remotely questions their wisdom. Accordingly, there is no reason for EPA to change them. Third, any attempt by EPA to eliminate netting is, at the very least, highly suspect under the long-standing decision in *Alabama Power Co. v. Costle*. *See also* UARG’s Comments on 2005 Proposal, Attachment 2 at 11-12. Finally, the “significant net emissions increase test” that EPA proposes to retain under Option 1 is the same test that the D.C. Circuit upheld in *New York I*.

B. How To Measure Hourly Emissions Increases

The supplemental proposal sets forth a number of alternatives for measuring hourly emissions increases. EPA asks for comments on three aspects of these alternatives: (1)

“achievable” or “achieved” tests; (2) “input-based” or “output-based” tests; and (3) implementation methods for an “achieved” test, *i.e.*, “one-in-5-year” baseline or a statistical approach for determining the “achieved” level of emissions.

1. The “Achievable” and “Achieved” Tests

UARG supports the maximum achievable hourly emissions increase test for the following reasons. First, adoption of this test would make the applicability test for NSPS and NSR the same for EGUs, and that consistency makes sense. After all, Congress specifically provided that EPA should define “modification” under NSR “the same ... as used” under NSPS. 42 U.S.C. § 7501(4); *see also* § 7479(2)(C). The Supreme Court held this language does not *compel* EPA to adopt the same test for NSPS and NSR. But surely that language provides no basis for *precluding* EPA from doing so and, indeed, supports EPA’s adoption of the same test for the two programs. Second, the achievable test has been applied under NSPS by utilities and regulating agencies alike for many years. It has stood the test of time and has provided regulated entities and regulators with the type of bright-line test and ascertainable certainty that sound regulatory programs should strive for. *See also* UARG’s Comments on 2005 Proposal, at 20-21. Third, it is a test that inherently incorporates the statutory causal link requirement between a change and the emissions increase because it is a test that requires a comparison of hourly emissions before and after the change *under the same representative conditions* (save those that the change alters). In other words, UARG agrees, “any increase in the emissions under the [maximum *achievable*] hourly emissions test would logically be attributed to the change.” 72 Fed. Reg. at 26206. There is no need under that test to undertake any complex analyses, whether before a project is done or after it, to distinguish between emissions increases due to the change and emissions increases due to factors independent from the change.

If the Agency ultimately decides to adopt an “achieved” hourly emissions increase test, however, it must carefully consider two issues, namely (1) how to ensure that the statutory causal link requirement is incorporated into the regulatory language, and (2) how to ensure that the test adopted into the regulatory language properly accounts for the inherent variability in the measurement of emissions rates on a short-term basis.

With respect to the first (“causal link”) issue, the supplemental proposal correctly recognizes that the statute requires a causal link between a proposed change and an increase in emissions for a modification to occur, just as EPA has recognized this requirement throughout the long history of the NSPS and NSR programs. *See* 57 Fed. Reg. 32314, 32326 (July 21, 1992) (“NSR will not apply unless ... there is a causal link between the proposed change and any post-change increase in emissions.”); *id.* at 32327 (Including into the NSR rules provisions that explicitly implement the causal link requirement “merely incorporates ... a requirement of the pre-existing statutory and regulatory scheme.”); 67 Fed. Reg. 80186, 80203 (Dec. 31, 2002) (same); *see also New York I*, 413 F.3d at 32-33 (noting, with approval, EPA’s acknowledgment that the language of CAA § 111(a)(4) “requir[es] ‘a causal link between the proposed change and any post-change increase in emissions.’”) (quoting 67 Fed. Reg. at 80203). In addition, EPA’s statement that both “the achieved and achievable tests eliminate the burden of ... distinguishing between emissions increases caused by the change from those due solely to demand growth,” 72 Fed. Reg. at 26206, is largely correct, to the extent “demand growth” generally affects long-term utilization of EGUs, not short-term utilization or emissions rates. But EPA’s next statement, that “any increase in the emissions under the hourly emissions tests would logically be attributed to

the change” is most certainly *incorrect* for the maximum achieved test.⁷ The reason is simple: “demand growth” is *not* the *only* independent factor that could affect a unit’s emissions rate. To be sure, demand growth affects capacity utilization, which is one of the determinants of a unit’s emissions rate. But emissions rates, as opposed to utilization, are affected by many more independent factors than demand growth. They are affected, for example, by coal quality, which includes the moisture content, sulfur content, heat content, ash content, and nitrogen content of the coal. Emission rates are also affected by the variability in the operation of control technologies, for example, ESPs, SCRs, and scrubbers. Control technology operations can affect emission rates both on a short-term basis (spikes) and long-term basis (catalyst changes, long-term deterioration and overhauls). In particular, control technology operations are affected by myriad ambient conditions, small and large -- including cooling tower efficiency, water temperature, and atmospheric pressure -- and they are affected by conditions that vary over cycles that can be longer than 5 years, *e.g.*, turbine overhauls at 7- or 8-year intervals. There is no reason to believe that a five-year baseline necessarily would capture all possible variability or changes in these factors.

The easiest example to illustrate this “causal link” issue is to look at a hypothetical change in sulfur content of the coal. It is well-established that the SO₂ emission rate of a boiler is essentially directly related to the sulfur content of the coal being burned in the boiler. Sulfur content is variable, however, even within the same type of coal or mine. After five or more years of operation with coal from one mine, the utility may, for whatever reason, start receiving coal from another mine or, even, a different seam at the same mine. Even a small increase in sulfur

⁷ As discussed above, UARG agrees with the statement for the “achievable” test because that test inherently accounts for the causal link requirement.

content of the coal would likely result in a commensurate increase in the SO₂ emission rate, all else equal. If the utility undertakes in the mean time a completely unrelated project that is a physical or operational change, it would clearly be incorrect to presume that the “increase in the [SO₂] emissions under the hourly emissions tests would logically be attributed to the change.” Quite the contrary, the increase might have nothing to do whatsoever with the change. Yet, a rote “maximum achieved” test that merely compares the maximum achieved hourly SO₂ emissions rate before the project to that achieved after the project would lead to the incorrect conclusion, *unless* the test accounts for causation.

2. Implementation Methods for a “Maximum Achieved” Test

EPA has proposed two methods for “computing maximum achieved emissions: (1) a statistical approach for determining if an EGU exceeds its pre-change maximum achieved hourly emissions rate based on the upper tolerance limit (“UTL”) process developed by the National Bureau of Standards; and (2) a “one-in-5-year baseline.” 72 Fed. Reg. at 26215. Because there is no evidence that the latter method appropriately accounts for measurement variability at EGUs and because we are unaware of any studies showing that five years of data is or is not long enough to account for such variability, UARG prefers the use of a statistical approach for computing maximum achieved emissions. UARG believes, however, that the specific statistical approach proposed by EPA is fatally flawed and should not be adopted as currently proposed. EPA’s proposed UTL method, however, could become a viable element of implementing a maximum achieved hourly emissions test under NSR if the method is slightly modified, along

the lines discussed below, to account both for the limitations of the method when applied to real data and the causation requirement.⁸

a) The statistical method, as proposed, is flawed.

The statistical method, as proposed, is fundamentally flawed primarily because it seeks to compare a statistical measure of a unit's performance in the baseline to the unit's performance *during every hour* of operation after a project. As EPA explains, "under the proposed methodology we would expect, with a 99 percent confidence level, 99.9 percent of the hourly emissions rate data to be less than the UTL value." *Id.* By the same token, therefore, assuming a unit operates in the post-project period *identically* to how it operated in the baseline period, one "would expect, with a 99 percent confidence level, [0.1] percent of the hourly emissions rate data to be [*more*] than the UTL value," not because of anything having to do with the project, but merely based on the statistical distribution of the data used to calculate the UTL. Thus, for example, for a unit that operates 8000 hours per year for the five-year period after the project, there will be 40,000 hourly data points. In a perfect statistical world (where the data are normally distributed), the UTL will include only 99.9% of those points, meaning that the remaining 0.1% of the points -- up to 40 hours -- will exceed the UTL. And with real data, which are likely not normally distributed,⁹ even more hours will exceed the UTL. In short, EPA's proposed test is one that units are bound to fail in the vast majority of circumstances, solely due to the variability of the data analyzed.

⁸ For the reasons discussed above, EPA has acknowledged that causation is a threshold statutory requirement for any emissions increase analysis under NSR.

⁹ See n. 10 and accompanying text for a more detailed discussion of real data that have been analyzed in a technical report that we are attaching to these comments.

In order to gain insight into the results that the UTL process might yield in practice and to determine if reasonable modifications could be made to the proposed process in order to improve it, UARG retained consultants to undertake an analysis of actual data from several units. Specifically, as explained in more detail in the attached report,¹⁰ UARG's consultants undertook analyses of NO_x and SO₂ emissions data for several EGU boilers with various combinations of coals and pollution control technologies. They assumed that after a hypothetical physical or operational change occurred in a given year, each boiler would operate in the same way -- *i.e.*, at the same loads, emissions, hours, etc. -- as it did during the five years before the change. That is, they assumed that the "change" undertaken by the boiler had no effect whatsoever on the unit's emissions profile for the entire five-year period following the change, as compared to the baseline. As discussed above, a purely theoretical analysis, assuming normally distributed data, would predict with near certainty that about 40 hours would exceed the UTL during the five years period. In fact, the review of actual plant data generally shows many more hours that would exceed the UTL. See UTL Report § 4 & Tables 2-3; § 5.5.2 & Tables 9-12, Figs. 3-4, App. B.

An additional problem with EPA's initial, proposed method is that the UTL would be based on hourly emissions rates reported in the CEMS during the highest ten percent of yearly operating hours in the baseline period, sorted by *heat input* rate, not emissions rate. Thus, under this method of sorting, it is entirely possible that some of the reported hourly emissions rates measured in the CEMS during hours not included in the dataset used to calculate the UTL would exceed the maximum emissions rate measured during hours upon which the UTL is based. Yet,

¹⁰ Lowell L. Smith and Michael C. Hein, *Analysis of the Upper Tolerance Limit Process Proposed by EPA for Determining the "Maximum Achieved Hourly Emissions Rate" for Electric Generating Units* (August 6, 2007) [hereinafter "UTL Report"] (enclosed as Attachment 1).

after the project, according to the proposed methodology, the emissions rates in *every* hour count. The flaw in this apples-to-oranges comparison is obvious.

- b) The statistical method, if modified, can be improved, but even with such improvements, false positives will not be avoided.

The UTL Report explored several variations on the statistical approach included in EPA's proposal. As discussed below, some yielded better results (*i.e.*, fewer false positives), but false positives could not entirely be avoided for all the units analyzed.

For example, a potential improvement on the heat-input sorting method proposed by EPA may include "sorting and extracting the data based on the hourly emissions rate itself" (as EPA suggested by requesting comment on such alternative sorting criteria), *see* 72 Fed. Reg. at 26216. The UTL Report evaluated such alternative sorting, as well as restricting the post-change dataset to the ten percent highest heat-input hours. These were improvements, but both alternative analyses still yielded large numbers of false positives. *See* UTL Report § 5.1-5.3 & Tables 4-6.

The UTL Report also evaluated possible modifications to other parts of the UTL process to respond to EPA's request for comment about varying the statistical parameters for the UTL method, namely "whether a 99 or 90 percentile of the population (of hourly emissions rate readings) would be more appropriate" than 99.9 percent; and "whether a 95 or 90 percent confidence level would be more appropriate" than 99 percent. Given that the proposed methodology is flawed at the levels proposed by EPA, it follows that the flaws would be greatly exacerbated if EPA were to use either a smaller threshold for the percentile of the population less than the UTL or a smaller confidence level. *See* 72 Fed. Reg. at 26216. Accordingly, the UTL Report explored whether *increasing* these values would help eliminate the problems with the UTL method.

Increasing the threshold for the percentile of the population and the confidence level would make sense because these parameters by definition reflect the likelihood and amounts of measurements that would be expected to exceed the UTL. In the NSPS setting context, EPA has used relatively high statistical measures to ensure no more than one exceedance in 10 years. Specifically, in the Subpart Da and subsequent NSPS rulemakings for utility steam generating units, EPA used a confidence interval of 99.9726 percent for 24-hour block measurements. For an hourly measurement, the equivalent confidence interval would be 99.9989 percent. In the NSPS or NSR applicability context, where *no* exceedance due to a physical or operational change may be allowed, it makes sense to use similarly high statistical measures.

The UTL Report thus analyzed the data for a threshold and confidence level of 99.98 percent. In addition, in these analyses, only the top 1 percent of data in the 365-day period were used to calculate the UTL, instead of the 10 percent sorting in the proposal. The rationale for that change is that, to the extent only a portion of the data are being used to calculate the UTL because the data provide a characterization of the unit at maximum operating conditions, 10 percent is too large, especially for cycling units. The results show that while increasing the threshold and confidence levels and using the highest 1 percent of the data would improve the results, there would still be false positives. *See* UTL Report § 5.4 & Table 7.

The UTL Report also looked at another slight variation to EPA's proposed UTL method, in which the UTL was calculated based on all hourly data (excluding those reflecting startup, shutdown or malfunction conditions) on a rolling 168-hour basis (roughly one week worth of data). *See* UTL Report § 5.6. The rationale for this variation, as explained more fully in the UTL Report, is that "[b]y selecting only the highest values of the parameters within the 365 day period, the process effectively distorts the natural variability of the data during that period." *Id.*

Thus, the use of roughly a week worth of data to calculate the UTL, without sorting or selecting a subset of that data, increases the likelihood that the data upon which the UTL would be based are (close to being) normally distributed and also capture “both the diurnal and weekly variations that typical utility EGUs experience during the year.” *Id.* This variation of the UTL method yielded significantly better results than others (in terms of fewer false positives), but still did not eliminate false positives altogether.¹¹

- c) If EPA adopts a statistical method to evaluate the maximum achieved hourly rate, it should further modify the method to ensure that it does not result in false positives, and it should explicitly account for the causal link requirement.

As discussed above, it is clear that the UTL method, as proposed, suffers from a fundamental flaw, in that it compares the statistical performance of a unit in the baseline period to its actual performance after a project, in a measurement environment that exhibits an extremely large variability. The consequence is a method that -- even if modified as also suggested above -- results in “false positives,” *i.e.*, circumstances in which the method finds an increase in the maximum achieved hourly emissions rate solely due to the variability of the data itself. Moreover, as also discussed earlier in these comments, a simple comparison of actual emissions achieved before a change to those actually achieved after that change -- without any consideration of whether the conditions under which these two values were measured are the same -- cannot possibly account, in and of itself, for the causal link requirement. Accordingly, if

¹¹ We also note that EPA’s statistical method has applicability limitations that we believe EPA should consider addressing in the preamble of the final rule. For example, it would appear that the statistical method may be difficult to apply (or be altogether inapplicable) for units that are not monitored with CEMS or PEMS, and for multiple units monitored with CEMS or PEMS in a combined stack (*i.e.*, a stack that serves more than one unit). Difficulties may arise also for pollutants that are controlled seasonally (*e.g.*, SCR operations during ozone season only).

EPA adopts a statistical methodology as part of an NSR maximum achieved hourly emissions increase test, it must address these issues.

As discussed in the remainder of this section of UARG's comments, we believe that EPA can address these issues by (1) adopting the same hierarchy for evaluating whether a project would result in an increase in the maximum achieved hourly emissions rate as EPA uses in the NSPS rules for evaluating maximum achievable emission rates; (2) changing the proposed statistical methodology to minimize the amount of baseline hourly data that would exceed the calculated UTL; and (3) explicitly accounting for causation in analyzing actual data.

Adopting the NSPS hierarchy for evaluating whether a project would result in an increase in the maximum achieved hourly emissions rate. Under the NSPS rules, EPA recognizes that whether a project might increase the maximum achievable hourly emissions rate of a unit can, in the vast majority of cases, be easily determined on the basis of engineering analyses. *See* 40 Fed. Reg. 58416, 58416 (Dec. 16, 1975) (explaining the rationale for requiring the use of emission factors in the first instance to evaluate emissions increases under NSPS). This is because a comparison of maximum achievable hourly emissions rates necessarily requires holding all conditions constant (and at values that would result in the maximum achievable rates), except for those conditions that are altered by the project. Thus, the analysis boils down to two inquiries: does the project result in the unit's (1) being able to burn more fuel than before or (2) emitting more of the pollutant in question per unit of fuel burned. These are questions that -- for most projects -- are easily answered with an engineering analysis. *See id.* In those situations in which an engineering analysis is inconclusive or "does not demonstrate to the Administrator's satisfaction whether the emission level resulting from the physical or operational change will either clearly increase or clearly not increase," CEMS or manual emissions tests may

be used to evaluate the effect of the change on emissions. 40 C.F.R. § 60.14(b). Importantly, whether CEMS or manual tests are used, the statistical procedures in Appendix C (of part 60) must be used. These procedures, in a nutshell, require testing under the *same representative conditions* before and after the project, thus ensuring that any difference in measured emission rates before and after a change are caused by the change, not by extraneous independent factors. These procedures also require a statistical comparison of the before and after results, not a comparison of a statistical measure before to every test point after. *See id.* pt. 60, App. C (using “Student’s t-test” to determine whether the mean of results before the change is significantly different from the mean of results after the change).

If the Agency is inclined to adopt an “achieved” test, UARG urges EPA to adopt a similar framework for determining whether a change would increase a unit’s maximum achieved hourly emissions rate. Such a framework would thus require the source to determine the baseline based on some measure of “achieved” hourly emissions (*e.g.*, a statistical methodology, such as the UTL method or a variation thereof) and an engineering analysis of whether the project would increase that rate under the same conditions as in the baseline, except for those conditions altered by the project. If the results of that analysis are unclear or disputed, then the source may rely on testing conducted under representative, *achieved* conditions before and after the change, using a statistical comparison similar to the Student’s t-test used in the NSPS rules. Under these two steps -- engineering analysis and manual tests -- causation is automatically accounted for because the conditions are the same before and after the change (except for any conditions that the project alters).

Changing the proposed statistical methodology to minimize the amount of baseline hourly data that would exceed the calculated UTL. Even if EPA adopts, for NSR purposes,

the NSPS hierarchy for evaluating whether a project would result in an increase in the maximum achieved hourly emissions rate, that would not eliminate the need for an evaluation of actual post-project data. Such an analysis would be warranted, for instance, in a situation in which there is a question after the fact as to whether a project may have increased the maximum achieved hourly emissions rate, especially where no manual test was undertaken (presumably because the source believed an engineering analysis was sufficient). For such an evaluation, UARG suggests that the final rule should require a comparison of post-project actual hourly measurements to a UTL calculated based on one of the two above-described UTL method variations that minimize the amount of exceedences in the baseline period, *i.e.*, (i) a UTL based on a rolling 168-hour analysis, *see* UTL Report § 5.6; or (ii) a UTL based on 99.98 percent confidence interval and the highest 1 percent of the measurements in any 365-day period in the baseline period, *see id* § 5.4. Either of these two approaches could be made workable, but UARG prefers the first option because it is theoretically more robust (for the reasons discussed above and in the UTL Report), and because it is more easily implemented (*i.e.*, it does not require sorting).

Explicitly accounting for causation in analyzing actual data. In addition, the final rule should explicitly account for causation. There are several reasons for this. First, because the above-recommended variations of the UTL method still show some data in excess of the UTL in the baseline period, the final rule should provide that the project could not have resulted in an increase in a unit's maximum achieved hourly emissions rate where the unit has the same or smaller number of measured hourly data in excess of the UTL after the project as it did during the baseline period. Second, and more generally, the final rule should make clear that if a unit's actual hourly emissions exceed the pre-project hourly emissions, the source may exclude from

the post-project emissions rate any emissions that the unit could have accommodated in the baseline period and that are unrelated to the project.

UARG believes that the framework and hierarchy of analysis described above, including a modified UTL method, would provide a reasonably robust way of evaluating whether an activity is projected to -- or does -- increase a unit's maximum achieved hourly emissions rate. Also as noted above, the modified UTL method would be superior to the "one-in-5-year baseline" approach, which does not necessarily account for all potential variability in CEMS data. Whatever method EPA may adopt for an achieved test, however, merely looking at measured emissions rates without considering underlying conditions cannot *ispo facto* account for whether any apparent change in emissions rates is due to an intervening project or some other, independent factor. Therefore, an achieved method must explicitly recognize the statutory causal link requirement for a "modification" to occur.

3. Input-Based and Output-Based Measures

In addition to proposing two different tests for determining a unit's pre-change maximum emissions rate (*i.e.*, the statistical approach and the one-in-5-year baseline approach), EPA proposes to let source owners have a choice of implementing the ultimately chosen test on either an emissions input basis (expressed in lb/hr) or output basis (expressed in lb/MWh). *See* 72 Fed. Reg. 26215-16. In its October 2005 proposal, EPA suggested it was considering allowing sources to use an output-based approach in order to encourage certain efficiency improvement projects.

If EPA's final rule includes only one of the proposed approaches (*i.e.*, an input-based approach *or* an output-based approach), UARG urges EPA to choose an input-based test. This would encourage both (a) projects that will improve efficiency, and (b) projects that are essential to maintaining the safety, reliability, and productive capacity of EGUs but that may result in a

small or even marginal decrease in efficiency. Examples of beneficial projects in the latter category include certain pollution control projects (which are now potentially subject to NSR due to the vacatur of the pollution control project exclusion in *New York I*).

Alternatively, UARG would support an approach under which EPA, in its final rule, allows source owners and operators to choose to use either an input-based or output-based approach. We would note, though, that if EPA wants to give source owners the option of using an output-based approach, it might first have to resolve a technical issue. It is well-established that, at least for coal-fired EGUs, the efficiency of the unit (often expressed in terms of “heat rate”) is not constant across the entire load spectrum and, indeed, typically is better at high load levels. Accordingly, all else being equal, one would expect a unit’s maximum hourly output-based emission rate to occur at low load levels, not at maximum (or near) load capacity. It is questionable whether it is appropriate, though, to base NSR applicability on an emissions rate measured at low load levels.

UARG would not support a program that *requires* an output-based test as the only option for source owners and operators. Requiring the use of an output-based test would have the unintended and detrimental effect of discouraging projects that are essential to maintaining the safety, reliability, and productive capacity of EGUs if those beneficial projects could result in a marginal decrease in efficiency.

C. Geographic Applicability

EPA proposes to apply the hourly emissions increase test for EGUs nationwide, but nonetheless requests comment on whether the applicability of the test should be limited to the geographic area covered by EPA’s Clean Air Interstate Regulation (“CAIR”), or to the geographic area covered by both CAIR and requirements for the installation of best available retrofit technology (“BART”). *See* 72 Fed. Reg. at 26218. UARG believes EPA should adopt a

rule of nationwide applicability, as proposed. The record strongly supports EPA's proposal to apply the rule nationwide and provides no basis for limiting the rule geographically. First, as EPA explained at the outset, the proposed rule, if adopted, would promote the safety, reliability and efficiency of EGUs. There is no reason to believe that these goals are any less important in areas not subject to CAIR or BART. Second, EPA conducted in this rulemaking a very thorough analysis of the potential impact of the rule on emissions from the electric utility sector, in terms of regional versus local effects as well as pollutants subject to the Acid Rain program, CAIR, and BART versus pollutants that are not subject to these programs. The results are unequivocal. There is no basis for limiting the rule geographically to the CAIR or CAIR/BART areas.

D. Pollutant Applicability

EPA proposes to apply the hourly emissions increase test for EGUs to all regulated NSR pollutants, but nonetheless requests comment on whether the applicability of the test should be limited to SO₂ and NO_x. *See* 72 Fed. Reg. at 26218. For the same reasons as those discussed above in connection with the geographic applicability of the proposed rule, UARG supports EPA's proposal to apply the rule to all regulated NSR pollutants. The goal of promoting the safety, reliability and efficiency of EGUs is better achieved by applying the rule to all regulated NSR pollutants. And, as discussed above, EPA's thorough analysis of the potential impact of the rule on emissions from EGUs, in which EPA specifically looked at the potential effects on emissions of regulated NSR pollutants other than SO₂ and NO_x, shows there is no basis for limiting the applicability of the rule to SO₂ and NO_x.

E. Recordkeeping and Reporting Requirements

UARG agrees with EPA that no additional recordkeeping and reporting requirements are required for this rule because EGUs already keep records and report vast amounts of data potentially relevant to determining whether a project resulted in an increase in maximum hourly

emissions rates (whether “achievable” or “achieved”). UARG believes that the Agency should not require additional recordkeeping and reporting for EGUs that are not using CEMS, because these EGUs are few and relatively small. Moreover, UARG believes that EPA’s over-reliance on CEMS is not justified, because the CEMS (1) exhibit extreme volatility for short-term measurements and (2) do not and cannot account for causation issues. For the vast majority of projects, a determination that a project does or does not increase maximum hourly rates can be readily made based on the engineering characteristics of the project, whether before or after the project. Only for those projects for which an engineering analysis is not sufficient to “demonstrate[] that the emission level resulting from the physical or operational change will either clearly increase or clearly not increase,” *cf.* 40 C.F.R. § 60.14(b), is it potentially justified to impose on EGUs that do not use CEMS some requirement to document its determination of non-applicability.

* * * * *

UARG appreciates this opportunity to comment on EPA’s supplemental proposal. As noted above, UARG strongly supports EPA’s proposal to adopt an hourly emissions increase test as a threshold requirement for what is a “modification” under the NSR program and to retain the source-wide significant net annual emissions increase requirements of the current NSR rules. In addition, UARG supports EPA’s option that would adopt for the NSR program the same “maximum achievable” hourly emissions test that has been implemented successfully under the NSPS rules for many years. If EPA ultimately decides to adopt an “achieved” test, however, UARG urges the Agency to account explicitly for the statutory requirement that there be a causal link between a change and any emissions increase and to establish the analytical approaches that may be used for implementing such a test.

Attachment 2

**COMMENTS OF THE UTILITY AIR REGULATORY GROUP
ON THE ENVIRONMENTAL PROTECTION AGENCY’S
PROPOSAL TO IMPLEMENT AN EMISSIONS TEST FOR
EXISTING ELECTRIC GENERATING UNITS SUBJECT TO THE RULES
GOVERNING THE PREVENTION OF SIGNIFICANT DETERIORATION AND
NONATTAINMENT MAJOR NEW SOURCE REVIEW PROGRAMS**

These are the comments of the Utility Air Regulatory Group (“UARG”) on the Environmental Protection Agency’s (“EPA’s” or the “Agency’s”) October 20, 2005 preamble explaining Agency plans for implementing an emissions test that determines which activities at existing electric generating units (“EGUs”) will trigger applicability of the Prevention of Significant Deterioration of Air Quality (“PSD”) and nonattainment New Source Review programs (collectively “NSR”) established by Parts C and D of Title I of the Clean Air Act (“CAA” or the “Act”). See 70 *Fed. Reg.* 61081.

UARG is an unincorporated group of approximately 50 individual electric utility companies and four trade associations: the American Public Power Association, Edison Electric Institute, National Rural Electric Cooperative Association, and National Mining Association. Since 1977, UARG has participated in virtually all key CAA rulemakings affecting electric utility companies and in subsequent litigation related to those rulemakings. In particular, UARG has been an active participant in the rulemakings and litigation related to the Act’s NSR preconstruction permitting programs. For example, UARG was actively involved in the 1977-78 rulemakings to implement the PSD permitting requirements of the 1977 Clean Air Act Amendments, and UARG (participating under the names of its individual members) was the lead petitioner in the seminal NSR case, *Alabama Power Company, et al. v. Costle*, 323 F.2d 636 (D.C. Circuit 1979) (hereinafter “*Alabama Power I*”¹). UARG has also been a participant in subsequent NSR rulemakings and litigation, including EPA’s rulemakings to implement the *Alabama Power II* decision and subsequent litigation (*Chemical Manufacturers Association v. EPA*, No. 79-112 (D.C. Cir.)); the Seventh Circuit litigation concerning an NSR issue at an individual company (*Wisconsin Electric Power Co. v. Reilly*, 893 F.2d 901 (7th Cir. 1990)) and the subsequent “WEPCo” rulemaking in 1992; the meetings of

¹ The D.C. Circuit issued a preliminary decision in the case, which appears at 606 F.2d 1068 and which is hereafter referred to as *Alabama Power I*.

the Clean Air Act Advisory Committee's New Source Review Subcommittee (the Subcommittee first met in the summer of 1992 and met frequently over the next four years to discuss ways to "simplify" or "reform" the NSR program); the 2002 and 2003 EPA rulemakings to revise portions of the NSR program and subsequent litigation (*New York v. EPA*, 413 F.3d 3 (D.C. Cir 2005), also known as "*NSR I*"; and *New York v. EPA*, No. 03-1380 (D.C. Cir.), also known as "*NSR II*"). Also, UARG has been an intervenor in some of the litigation arising out of EPA's late 1990s NSR enforcement initiative (e.g., *U.S. v. Duke Energy Corp.*, 411 F.3d 539 (4th Cir. 2005)).

In addition to UARG's having familiarity with the history of NSR regulations, UARG's individual members have practical, hands-on experience with the application of the NSR programs and with other Clean Air Act programs, including EPA's new source performance standards ("NSPS") program under CAA §111.

Based on this extensive knowledge of NSR, UARG members strongly support EPA's plan to implement the approach described in the October 20, 2005 notice for determining if a project at an existing EGU will trigger applicability of the NSR regulatory programs. In particular, UARG supports the plan to make the test the same as that in the NSPS program.

I. OVERVIEW OF UARG'S COMMENTS

In its October 20, 2005 preamble, EPA says it plans to propose rules that will, at least for utility sources, limit NSR preconstruction permitting of projects at existing emission units to those that are "modifications" under EPA's NSPS program. Under the NSPS program, a project at an existing unit of a major stationary source will be considered a "modification" if the project is one that increases the unit's maximum hourly emission rate. UARG supports EPA's use of the maximum hourly emission rate increase test. UARG believes this approach is fully consistent with the requirements of the CAA and with the recent court decisions interpreting the NSR provisions of the Act.

In addition, UARG supports retention of the current annual emissions increase test for determining if a project is a "major modification" under the Clean Air Act. It is UARG's view that the hourly emissions test is a component of the annual emissions test, as explained by the court in *U.S. v. Duke Energy*, 278 F.Supp.2d 619, 643 (M.D.N.C. 2004). Specifically, if a project is determined not to be a "modification" under the hourly

maximum emissions rate increase test, then that project would not need to be evaluated to determine if it is a “major modification” under the annual emissions increase test of the NSR rules. If, however, a project is determined to be a “modification” under a maximum hourly emissions rate increase test, then -- to determine whether it is also subject to NSR -- the project should be evaluated to determine if it is a “major modification” under the annual emissions increase test of the NSR rules. In this way, only if the project is deemed to be both a “modification” under the maximum hourly emissions rate increase test and a “major modification” under the annual emissions increase test would the project be subject to NSR.

II. EPA’S PLAN TO ADOPT AN HOURLY EMISSIONS RATE INCREASE TEST IS FULLY CONSISTENT WITH THE CLEAN AIR ACT

As described in more detail below, EPA at a minimum has discretion to exclude from the NSR process projects at existing sources that are not NSPS “modifications.” Specifically, EPA may -- as it is proposing to do -- use the NSPS regulatory definition of “modification” (which includes an hourly emissions rate increase test) to determine if a source triggers application of the new source review process. EPA’s proposed change is wholly consistent with the text of the Clean Air Act, with congressional intent, with EPA’s regulations under the Clean Air Act, and with past EPA actions. It is also consistent with recent case law.

A. The Clean Air Act, At a Bare Minimum, Authorizes EPA to Define “Modifications” in the Same Way for the NSR and NSPS Programs.

Congress did not specify how emissions increases were to be calculated under the NSR program. Both the plain language and legislative history of the Clean Air Act, however, support (if not require) EPA’s using the same test for triggering applicability of the NSPS and NSR programs.

Congress in 1970 defined the term “modification” under the Clean Air Act’s NSPS provisions as “any physical change in, or change in the method of operation of, a stationary source which increases the amount of any air pollutant emitted by such source or which results in the emissions of any air pollutant not previously emitted.” 42 U.S.C. § 7411(a)(4). The 1970 CAA also directed EPA to promulgate more detailed regulations

governing the NSPS. Under these regulations, issued in 1971, EPA defined “modification” in substantially the same way:

Modification means any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted into the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) into the atmosphere not previously emitted.

40 C.F.R. § 60.2; 36 Fed. Reg. 24,876 (1971).

Under these 1971 rules, certain activities, including certain increases in production rate and increases in the hours of operation of a source, were specifically excluded from the definition of “modification.” 40 C.F.R. § 60.2(h) (1971). Thus, from the earliest days of the Clean Air Act and the NSPS program, EPA’s regulations provided that only activities that increased the operating design capacity of a source to increase the temporal emission rate of an air pollutant would be considered “modifications.”

In 1975, EPA clarified that this temporal measure would be hourly: “Emission rate shall be expressed as kg/hr of any pollutant discharged into the atmosphere” 40 C.F.R. § 60.14(a), (b); 40 Fed. Reg. 58,416 (1975). In other words, the test to determine whether an emissions increase had occurred so as to constitute a “modification” at an existing source would look to whether the emissions in kilograms per hour after the change were higher than the emissions in kilograms per hour before the change. If they were higher, the source would be subject to NSPS permitting requirements unless otherwise excluded. The test would not rely on annual increases in pollutants as a basis for determining a modification.

In 1974, in response to a court injunction, EPA promulgated the PSD program for new and modified stationary sources. 39 Fed. Reg. 42,510 (1974). “Modification” and “modified source” were also defined here to require an increase in “emission rate” and contained the same exclusions as those under the NSPS December 1971 rules. EPA specified that these definitions were meant to be “consistent with the definition used in Part 60” of the Clean Air Act. 39 Fed. Reg. 42,513 (1974). In this pre-1977 PSD regulatory program, EPA calculated emissions increases on an hourly emissions rate basis.

When Congress debated and passed the comprehensive 1977 Amendments to the Clean Air Act, it did not change the emissions rate increase test for determining if a project would trigger applicability of the new source review process. Specifically, in codifying in part EPA's PSD program, Congress allowed that certain of EPA's 1974 NSR rules (including the rule defining "modification"), would continue in effect without change. Congress also specifically defined NSR program coverage in reference to the NSPS statutory definition of "modification" under 42 U.S.C. § 7411(a)(4). Thus, Congress legislated in direct reference to the existing regulatory PSD program, did not change the 1974 PSD rules' definition of "modification," and added language assuring that, as in 1970, "modification" would be consistently applied under all the new source programs -- NSPS, PSD and nonattainment NSR.

In 1978, EPA issued new NSR rules in response to the 1977 Clean Air Act Amendments. 43 Fed. Reg. 26,388. Although the 1978 rules introduced new concepts into the NSR regulatory program, including a definition of "major modification,"² they did not change the regulatory definition of "modification."

In short, EPA's original new source review rule's definition of "modification" -- which has remained on the books virtually unchanged since 1974 and has not been altered by Congress -- gives EPA the discretion to define that term in the NSR program exactly as it now plans to do: making the definition of that term fully consistent with its meaning under the NSPS program.

B. Recent Court Decisions Confirm EPA's Authority to Define "Modification" the Same Way Under Both the NSPS and NSR Programs.

Recent court decisions confirm that EPA may define the term "modification" the same way in both the NSPS and NSR programs. In fact, the Fourth Circuit went even further in its June 2005 decision in *U.S. v. Duke Energy*, 411 F.3d 539 (4th Cir. 2005), holding that Congress had mandated that the PSD program's definition of "modification" be identical to the NSPS definition, and thus that EPA cannot interpret "modification"

² The 1978 rules limited NSR applicability to those NSPS modifications that were "major modifications." A "major modification" was defined in those rules to mean a change that increased a source's "potential emission rate" by a certain number of tons per year.

under NSR inconsistently with the way it interprets that term under NSPS. *Duke Energy*, 411 F.3d at 547. Shortly thereafter, the D.C. Circuit, in *New York v. EPA*, 413 F.3d 3 (D.C. Cir. 2005) (“*NSR I*”), expressly declined to address the significance of the Fourth Circuit’s holding on this point, thus not putting any judicial roadblocks in the path of EPA’s current plan to define “modification” the same way under both the NSPS and NSR programs. Indeed, the D.C. Circuit in *NSR I* expressly held that EPA has the discretion to define how emission increases are to be calculated because congress did not specify this. *See id.* at 27.

In sum, the entire history of statutory and regulatory enactments and interpretation of the Clean Air Act bolsters the legal underpinnings of EPA’s proposed hourly emissions increase test. EPA may -- indeed, we believe, EPA must -- use the NSPS program’s definition of “modification” to decide whether a project is a “modification” under the Act and thus subject to the permitting requirements of the NSR program.

III. RESPONSES TO SPECIFIC QUESTIONS RAISED IN EPA’S NOTICE

EPA’s October 20, 2005 preamble asks for guidance on specific aspects of the Agency’s plans to implement an hourly emissions rate increase test for use in determining if projects at EGUs will trigger application of the NSR permitting program. The following are UARG’s preliminary responses to some of those questions. UARG plans to provide additional comments and in certain instances more detailed comments on these and other issues once EPA develops a more specific proposal (including regulatory language).

A. How To Measure Emissions Increases

EPA says it is considering three different forms of an “hourly emission rate increase” test. Its preferred approach is one that would parallel the language/approach in the NSPS program: comparing the maximum hourly emissions rate *achievable* at a unit during the 5 years preceding a physical or operational change to the maximum hourly emissions rate achievable at that unit after the change to determine whether an emissions increase would occur. Alternatively, EPA asks for public comment on a test comparing maximum hourly emissions rate *achieved* at a unit before a change to the maximum hourly emissions rate achieved at the unit after the change. EPA also asks for comment

on another alternative or additional test under which an emission increase would be based on “mass of emissions per unit of energy output, such as lb/MW hour or nanograms/per Joule.”

1. The “Achievable” and “Achieved” Tests

EPA suggests there is no meaningful difference between the *achievable* test and *achieved* test because for “most, if not all EGUs, the hourly rate at which the unit is actually able to emit is substantively equivalent to that unit’s historical maximum hourly emissions.” 70 Fed. Reg. 61091 col. 1. The two tests are not equivalent in many instances, however, and when they are equivalent, that might not be for the reasons that EPA states.

An example can be used to explain this point. Consider a comparison of pre-project and post-project SO₂ emissions at a source, where -- during the pre-project period -- the source has burned coal with a lower-than-allowed sulfur content. This may happen because the coal available to a source during the pre-project period is lower in sulfur content than is permitted. Or it may happen because the source owner -- as a part of its strategy to implement Title IV and CAIR requirements -- does a variety of things to operate its facility so that its SO₂ emission rate is well below permitted levels. In this example -- and in similar examples (involving NO_x and particulate matter) -- if a unit’s post-project emissions rate for a pollutant is higher, it will not necessarily be higher as a result of the change. Rather, it may be higher as a result of factors entirely independent of the change (*e.g.*, the variability of the sulfur content in the coal being burned). Because of this, if EPA chooses to use the *achieved* test in its regulatory proposal, EPA should ensure that the *achieved* test is drafted so as to take “causation” into account. EPA can do this by holding constant operating conditions before and after a project. Of course, by making the *achieved* test a comparison of a unit’s “achieved emissions rate before the change” with the unit’s “achieved emissions rate under similar operating conditions after the change,” the test becomes essentially equivalent to the *achievable* test that EPA has described. For these reasons, UARG supports EPA’s preferred option, *i.e.*, using the maximum hourly emissions rate *achievable* test.

UARG offers the following additional comments in support of the adoption of the *achievable* test. First, adoption of the *achievable* test would make the applicability test

for NSPS and NSR the same for EGUs, and that consistency makes sense. After all, Congress specifically provided that EPA should define “modification” under NSR “the same ... as used” under NSPS. 42 U.S.C. § 7501(4); *see also* § 7479(2)(C). Also, the *achievable* test is workable and enforceable; it has effectively been used for decades to determine applicability of the NSPS.³

Moreover, as discussed further below, the “achievable” test is consistent with the court decisions in *NSR I* (which upheld the NSPS utility “achievable” test with a 5-year look-back period),⁴ *Duke Energy*, *WEPCo*, and *Alabama Power*.⁵

³ We also urge EPA to implement the NSR hourly emission rate increase test the same way it implements the NSPS *achievable* emission rate increase test, which allows source owners to use alternative approaches for evaluating whether a project will result in an emission rate increase. Under 40 C.F.R. Part 60.14 (b)(1), parameters unrelated to the physical change being evaluated (typically, these would include fuel characteristics and whether the unit is operating flat out or at some other level) are held constant, and emission factors like those in AP-42 can be used to evaluate whether a particular project will result in an hourly emissions rate increase. Under 40 C.F.R. Part 60.14 (b)(2), actual measurements can be used to determine if an increase in a unit’s maximum hourly emissions rate has occurred. When this approach is followed, though, statistical methodologies are used to evaluate whether a slight change in a measured reading taken after a project reflects a true emissions rate change or whether, instead, the post-project measured “change” is the result of the inherent variability of the measurement technique(s) being used to evaluate EGU performance. Specifically, 40 C.F.R. Part 60, Appendix C directs a project evaluator to look at several emission rate measurements before a change and several emission rate measurements under the same operating conditions after the change, and only if the difference between the two sets of readings is statistically “significant” would one conclude that a project has resulted in an hourly emissions rate increase.

⁴ *NSR I* should not be read to suggest that the achievable test is inconsistent with the use of actual emissions. Indeed in *NSR I*, the D.C. Circuit rejected the Environmental Petitioners’ challenge (Opening Brief of Environmental Petitioners at 46 n.21) to “the lawfulness of the ‘hourly emissions rate at maximum operating capacity’ comparison, or the lawfulness of the ‘hourly emissions rate’ test generally.” *NSR I*, 413 F.3d at 27. In rejecting this argument, the D.C. Circuit likewise rejected the Environmental Petitioners’ argument that the NSPS rule for electric utility sources (which requires an increase in hourly emission rate “above the maximum hourly emissions achievable at that unit during the 5 years prior to the change”) was illegal because it allowed emission increases. *Id.* at 46. Thus *NSR I* upheld the hourly emissions rate approach that EPA is proposing in this rule.

⁵ The “achievable” test is consistent with *Alabama Power I* and *Alabama Power II* in that it is based upon actual emissions. One of the issues evaluated by the court in

2. The Output-Based Hourly Emissions Increase Test.

EPA has asked for comment on a possible third hourly emissions increase test, *i.e.*, one that would be based on “mass of emissions per unit of energy output, such as lb/MW hour or nanograms/per Joule.” Before UARG members can comment on such a test, however, we need to understand better how this approach would work. Even if the test is based on admirable goals and even if it is workable, however, it cannot be a substitute for the maximum hourly emissions rate increase test and the annual emissions increase test. If EPA proceeds with an output-based approach in the subsequent more specific proposal, UARG strongly suggests that this option be an alternative test at the election of the owner or operator of the source and not the sole hourly emissions rate increase test.

B. Retention of the Annual Emissions Increase Test

EPA asks for comment on whether it should retain the current annual emissions increase test for determining if a utility project is a “major modification” under the Clean Air Act. It is UARG’s view that EPA must retain the annual emission increase test.⁶ As explained by the court in *U.S. v. Duke Energy*, 278 F.Supp.2d 619, 643 (M.D.N.C. 2003),

Alabama Power was the statutory language referring to facilities “which emit or have the potential to emit” pollutants. In defining a major emitting facility’s “potential to emit” under the 1978 PSD rules, EPA had failed to give credit to emission reductions attributable to the installation and operation of pollution control devices. The *Alabama Power* court sustained a challenge brought to this aspect of EPA’s “potential to emit” definition, holding that EPA must take into account the operation of pollution controls in applying the term. The court reasoned that “[w]hen potential emissions are calculated, as EPA provided, by assuming operation at full capacity, without any reduction to take into account the operation of the facility’s air pollution control equipment, then potential emissions will always and inherently exceed actual emissions.” *See Alabama Power II*, 636 F.2d at 353. That, continued the court, would essentially write out of the statute the word “emit” in the phrase “emit or have the potential to emit.” To prevent that from happening, the D.C. Circuit explained that the term “emit” refers to those instances where the pollution control equipment “has not been operated, or has been operated at variance from design.” *Id.*

⁶ Retaining the current annual emissions increase test for evaluating whether utility projects are “major modifications” under the CAA also minimizes the overall regulatory changes EPA would have to make when implementing the NSR hourly emissions rate increase test.

the hourly emissions test is a component of the annual emissions test. Specifically, if a project is determined not to be a “modification” under the hourly maximum emissions rate increase test, then that project would not need to be evaluated to determine if it is a “major modification” under the annual emissions increase test of the NSR rules. If, however, a project is determined to be a “modification” under a maximum hourly emissions rate increase test, then -- to determine whether it is also subject to NSR -- the project should be evaluated to determine if it is a “major modification” under the annual emissions increase test of the NSR rules.⁷ In this way, only if the project is deemed to be both a “modification” under the maximum hourly emissions rate increase test and a “major modification” under the annual emissions increase test would the project be subject to NSR unless otherwise excluded.

C. EPA’s Proposal to Eliminate “Significance” Levels.

Under the *annual* emissions increase test, an annual increase in the amount of a regulated pollutant emitted by a unit will not trigger the NSR process unless it is a “significant” net emissions increase. The current rules then include specific levels of emissions that are deemed to be “significant” on an annual basis, *e.g.*, anything greater than 40 tons per year for sulfur dioxide. In contrast the maximum hourly emissions rate increase test described in EPA’s October 2005 preamble would not incorporate any exclusion for an hourly emission rate increase that is small or “insignificant.” EPA’s stated reason for this approach is administrative convenience. In originally creating the annual “significance levels,” EPA says it relied on its “belief that Congress did not intend to regulate every physical or operation change at a major source.” Now that it is focusing on the maximum hourly emissions rate increase test, however, EPA says it is “more administratively efficient to eliminate the need to compute significant emission rates from the proposed emissions test.” 70 Fed. Reg. 61092 col. 3.

⁷ In that case, the “actual annual emissions increase” test under the NSR rules should apply. In implementing the actual annual emissions increase test, however, we recommend that EPA adopt the same look-back period for utilities that it has for other sources, *i.e.*, a 10-year look-back period rather than the 5-year look-back period now applicable to utilities. There is no basis to have look-back periods of different lengths in the rules.

UARG cannot assess the reasonableness of this approach until EPA provides regulatory language to implement the NSR hourly emissions rate increase test. Once EPA does that -- for example, indicating that it plans to use the same approach it has used to implement the NSPS *achievable* hourly emissions rate increase test -- then UARG will try to provide comments on EPA's suggestion that it need not exclude an hourly emission rate increase that is *de minimis*.

In any event, EPA's decision on whether or not to incorporate "significance" levels into the maximum hourly emissions rate increase NSR test should have no impact on the continued incorporation of significance levels into the annual emissions increase test.

D. Proposal to Eliminate Netting.

EPA proposes to eliminate netting when it implements the maximum hourly emissions rate increase test. Although UARG is not yet prepared to comment on whether EPA should include netting in implementing the maximum hourly emissions rate increase test (that depends upon whether EPA can find a way to address the complications it has referred to in its preamble⁸), UARG strongly believes that EPA cannot eliminate netting entirely when determining if a project is subject to new source review.

When Industry challenged EPA's PSD rules in *Alabama Power* because it wanted to be able to "make changes in a single emitting facility, without prior permit or authorization, provided such a change in design or operation that increases emissions is offset by other contemporaneous changes that decrease emissions so there is no net increase in the potential to emit any air pollutant" (*Alabama Power*, 606 F.2d at 1081), the D.C. Circuit ruled that EPA's regulations that restricted "the ability of the emitter to make such offsetting changes without permission . . . are beyond EPA's authority." *Id.* The court held that EPA's authority to circumscribe industry's freedom to offset is confined to the Agency's "broad discretion to define the components of the term

⁸ To address this issue, EPA should consider adopting the netting approach used in the 1975 NSPS rules. Although that test was deemed to be inappropriate for use in an NSPS program that excludes netting (see *ASARCO, Inc. v. EPA*, 578 F.2d 319 (D.C. Cir. 1978)), there is no reason it couldn't be incorporated into the NSR program where -- as discussed below -- netting is required.

‘stationary source’ so as to provide a narrow scope.” *Id.* The original *Alabama Power* summary opinion was superceded by a longer opinion, *Alabama Power v. Costle*, 636 F.2d 323, 343 (D.C. Cir. 1979), that sustained the original decision with respect to netting in all pertinent respects. The court held that the restrictions that EPA had placed on the “bubble concept” in its rules “was never intended by Congress in enacting the Clean Air Act Amendments.” *Id.* at 401. In holding that the Act requires EPA to allow netting, the D.C. Circuit emphatically stated

[w]here there is no net increase from contemporaneous changes within a source, we hold that PSD review, whether procedural or substantive, cannot apply.

Id. at 403.

Although we believe the law requires EPA to make netting a part of any PSD analysis, we believe that netting can be incorporated into PSD reviews even if a reasonable way cannot be found to include netting when determining if a project is a “modification” under the maximum hourly emissions rate NSR test. Specifically, netting could still be taken into account in determining if a project is a “major modification” under the current NSR rules. In other words, if a project is deemed to be a “modification” following the application of the maximum hourly emissions rate test, then we would urge that the source owner be allowed to proceed to determine if the project would nevertheless be excluded from the NSR process because it is not a “major modification” under the current NSR rules, which include netting provisions.

On a related point, EPA has said that if the Agency makes netting a part of the maximum hourly emissions rate increase test, it might shorten the “contemporaneous” period to the time of construction and allow EGUs to use only “project” netting in computing whether a physical or operational change results in an emissions rate increase. Given the lack of information available on how EPA would define an individual “project,” UARG cannot now support this approach. If EPA continues to work on this, we urge the Agency to describe its approach in sufficient detail so that commenters can intelligently address it in the next round of comments (when EPA is expected to propose the regulatory language for implementing its proposal).

E. Pollutants to Which the Applicability Test Would Apply

EPA asks for comment on whether its NSR hourly emission rate increase test should apply to all Clean Air Act-regulated NSR pollutants or only to some subset of those regulated pollutants. EPA believes that it is legally required by the statute and *Alabama Power* to evaluate each Clean Air Act-regulated pollutant⁹ for which a plant modification has resulted in an emissions rate increase. We agree with that conclusion. We disagree, however, with EPA's suggestion that this will not present any meaningful burdens on permit applicants because "the application of the major NSR program to EGU emissions increases of regulated NSR pollutants other than SO₂ or NO_x would be unlikely to result in the implementation of any additional controls." 70 Fed. Reg. 61092, col. 3. Even if the application of the program to other pollutants -- *e.g.*, CO, lead, or VOCs -- would not result in the installation of additional controls on those pollutants, the inclusion of those pollutants in the overall analysis would cause permitting delays while modeling or BACT reviews are done. Those delays are all the more wasteful and unwarranted given that the modeling and BACT reviews are highly unlikely to result in any additional controls, as EPA acknowledges.

This has become a much more troubling issue for many planned utility projects since the D.C. Circuit struck down the Agency's pollution control project exclusion in the NSR rules in *NSR I*. That might be less of an issue in the implementation of the maximum hourly emissions rate increase test if (as recommended above) EPA also retains its annual emissions increase test and applies it in those circumstances where, for one or more regulated pollutants, a project is deemed to be a "modification" under the hourly emissions increase test. In those circumstances, the project could then be evaluated to determine if it is a "major modification" for those pollutants failing the first test. If the emissions increases for those pollutants are then evaluated under the annual emissions increase test and are found to be insignificant (as that term is defined under the current NSR rules), then the project would not trigger NSR review. EPA's

⁹ Clean Air Act-regulated pollutants exclude those pollutants regulated under §112 of the Act. See 42 U.S.C. §7412(b)(6).

implementation of the program in this way would satisfactorily address our concerns about EPA's evaluation of other Clean Air Act-regulated pollutants.

F. The Maximum Hourly Emissions Rate Increase Rule Should Apply to the Entire Nation.

After devoting much column space to explaining that the CAIR and BART rules will result in nationwide reductions in emissions from EGUs and thus that one need not depend on an NSR program to get any needed reductions, EPA says it prefers to apply the program nationwide, but asks for comment on whether its proposed emissions increase test should apply nationwide or only in part of the country (*e.g.*, only in CAIR states).

UARG agrees with EPA's preferred approach of applying the program nationwide. UARG, however, disagrees with parts of EPA's rationale for making the program nationwide (*i.e.*, just because of the existence of CAIR and BART). As discussed above in section II of these comments, regardless of CAIR and BART, the statute requires an evaluation of whether a project located anywhere in the United States will result in an hourly emissions rate increase in order to evaluate whether that project constitutes an NSR modification. NSR applicability is not dependent upon the existence of other regulatory programs. As discussed more fully later (section IV.E) and as acknowledged by EPA, NSR is not an emissions reduction program. It is a program to regulate expansions of capacity, *i.e.*, growth. Other CAA programs amply provide the means to, for example, bring nonattainment areas into attainment and otherwise protect air quality.

G. The Rule Should Be Part of EPA's Core Program.

EPA proposes making its emissions increase test a core, mandatory minimum program element for SIPs implementing the Part C and Part D major NSR programs. UARG agrees with this position.

H. Computing Offsets and Emissions

EPA is not proposing to change its current method for computing the availability of offsets in nonattainment areas or for computing emissions for purposes of conducting an ambient impact analysis. UARG agrees with EPA's approach.

I. The Definition of EGUs

EPA has proposed broadening the definition of EGUs to include combustion turbines, both simple and combined cycle. UARG agrees with EPA's approach.

J. Record-keeping and Reporting

EPA's October 2005 preamble does not include information on what, if any, record-keeping needs to be done to verify that an emissions rate increase has not occurred. The utility industry is currently one of the heaviest regulated industries. Our sources are required to develop and report extensive amounts of data. Therefore, we would hope that EPA would, in implementing the program, make use of the large, existing data base and would not require the creation of yet more data.

IV. THE MAXIMUM ACHIEVABLE HOURLY EMISSIONS RATE INCREASE TEST WILL BE SIMPLE AND STRAIGHTFORWARD TO IMPLEMENT AND ENFORCE.

EPA's plan to develop a maximum hourly emissions increase rate test for NSR applicability has been criticized by some in the press and at EPA's public hearing on this proposal as being inconsistent with the Clean Air Act and difficult (if not impossible) to implement. Section II of UARG's comments responds to criticisms concerning the legal basis for the rule. This section of UARG's comments responds to criticisms regarding the rule's "implementability" or "enforceability."

A. The Proposed Rule Will Address Capacity Increases

Critics of the proposal have claimed that certain "known capacity increases" would escape new source review permitting under the terms of the proposal. The problem with their analysis, however, is that it is based upon the preconceived -- and often incorrect -- notion that any time there is an annual emissions increase after a project is undertaken, the increase is due to a capacity increase.

For example, one criticism suggests that utilities frequently undertake projects such as redesigns of reheaters or similar equipment that transform smaller units into units with 10-15% more capacity resulting in post-project annual increases of SO₂ and NO_x emissions. If any such project did result in an actual increase in the emitting capacity of a unit such that there would be a 10-15% increase in the unit's maximum hourly emission

rate, then the project should be subject to new source review and would be subject to such review under EPA's proposal. Under EPA's proposal, though, if this project did not result in an increase in the unit's previous hourly emissions rate capacity, then it would not be covered by the NSPS or new source review preconstruction permitting requirements, a result that is fully consistent with the Clean Air Act and Congressional intent (see section II of these comments above).

The critics who raise these concerns seem to refer to "capacity" as a source's annual emissions. But annual utilization of a unit, and therefore its annual emissions, fluctuate from year to year, depending primarily on factors which are unrelated to any projects at a unit, including demand for electricity, dispatch economics, and the status of other units on the system. These critics confuse the terms "capacity" with "capacity utilization."¹⁰ Consistent with the exclusions in the existing rule for changes in hours of operation, production rate, alternative fuels, etc., we believe that the appropriate focus of the NSPS and PSD programs should be on regulating capacity expansion, not a unit's already permitted and analyzed capacity utilization. A unit that is permitted to emit at a given capacity does not become a "new" unit under the CAA because its capacity utilization changed from year to year. Thus, UARG believes that in both the NSPS program and PSD program, "capacity" must be (and is appropriately) measured in terms of a source's maximum hourly emission rates, not fluctuations in annual emissions from year to year. If there is no hourly emission rate increase from a project, there is no capacity increase. With this approach, the appropriate focus for both EPA and state air agencies will be "on reviewing all changes that result in increases in existing capacity," 70 Fed. Reg. at 61092, col. 3, while at the same time allowing "changes that, without increasing existing capacity, promote the safety, reliability and efficiency of EGUs." *Id.* at 61093, col. 3.

¹⁰ "Capacity" is typically a set quantity that is readily determined by the unit's physical capability. "Capacity utilization" is a changing quantity that depends on multiple factors, most of which are external to and independent of the unit. Units are permitted under state and CAA programs, and analyzed under the SIPs, on the basis of their capacity, not what happens to be their capacity utilization in one year or the other.

B. Response to Calls for the Use of “Representative” Emissions

Claiming there would be “difficulties” associated with implementing a maximum achievable hourly emissions rate increase test, some have recommended that any hourly emissions rate increase test be based on the use of “representative” rather than “maximum achievable” emissions. As discussed above, the difficulties some identify as associated with EPA’s current proposal have not manifested themselves in the decades-old NSPS program, which is based on the use of a maximum hourly achievable emissions rate test; thus, we question why those difficulties would suddenly appear if the same test were to be used to evaluate NSR applicability.

In addition, we question why the use of a “representative” emissions test approach would be devoid of complications. Complications would certainly arise if EPA followed the recommendations of those urging it to use various data adjustments or corrections to create a “representative” hourly emissions rate baseline. (Some have even suggested there might be circumstances in which actual hourly emissions rate data could be excluded from consideration if the data, though real and actual, were not “representative.”)

Pursuing the idea of using representative hourly emissions rate data as part of this proposal would continue the uncertainty created by EPA’s enforcement approach to NSR, where “it can be difficult for the owner or operator to know with reasonable certainty whether a particular activity would trigger major NSR” under the current rules. 70 Fed. Reg. at 61093, col. 3. EPA has observed that with the uncertainty created by the current rules “there is a possibility that EPA could ... make a different applicability determination than the State has made.” *Id.* at 61094, col. 1. UARG strongly endorses a bright-line test, which would allow sources to make compliance determinations in a timely and clear-cut manner. *Id.*, col. 2. Any regulatory approach where ad hoc “adjustments” or “corrections” would need to be made to past emissions would be the antithesis of having clear rules.

For these reasons and others discussed above, we believe that EPA’s proposal to use a maximum achievable hourly emissions rate increase test makes sense and the use of an alternative approach that does not recognize a source’s actual capacity to emit does not make sense.

C. EPA's Proposed "Achievable" Test Is Enforceable.

Some opponents of this approach believe that utilities have many ways to show that a particular capacity is or was theoretically achievable, which makes analysis of the impact of the test difficult and application of the test largely unenforceable. This is incorrect. The maximum hourly achievable emissions rate test that EPA is planning to develop for use in the NSR program is the same test that has been in force -- and has been enforceable -- under the NSPS program for decades.

Under the NSPS rules, the emission rate is determined as follows:

Emission rate shall be expressed as kg/hr of any pollutant discharged into the atmosphere for which a standard is applicable. The Administrator shall use the following to determine emission rate:

(1) Emission factors as specified in the latest issue of "Compilation of Air Pollutant Emission Factors," EPA Publication No. AP-42, or other emission factors determined by the Administrator to be superior to AP-42 emission factors, in cases where utilization of emission factors demonstrates that the emission level resulting from the physical or operational change will either clearly increase or clearly not increase.

(2) Material balances, continuous monitor data, or manual emission tests in cases where utilization of emission factors as referenced in paragraph (b)(1) of this section does not demonstrate to the Administrator's satisfaction whether the emission level resulting from the physical or operational change will either clearly increase or clearly not increase, or where an owner or operator demonstrates to the Administrator's satisfaction that there are reasonable grounds to dispute the result obtained by the Administrator utilizing emission factors as referenced in paragraph (b)(1) of this section. When the emission rate is based on results from manual emission tests or continuous monitoring systems, the procedures specified in appendix C of this part shall be used to determine whether an increase in emission rate has occurred. Tests shall be conducted under such conditions as the Administrator shall specify to the owner or operator based on representative performance of the facility. At least three valid test runs must be conducted before and at least three after the physical or operational change. All operating parameters which may affect emissions must be held constant to the maximum feasible degree for all test runs.

40 C.F.R. § 60.14 (b). Moreover,

No physical change, or change in the method of operation, at an existing electric utility steam generating unit shall be treated as a modification for the purposes of this section provided that such change does not increase the maximum hourly emissions of any pollutant regulated under this section above the maximum hourly emissions achievable at that unit during the 5 years prior to the change.

40 C.F.R. § 60.14 (h).

These regulatory provisions have been interpreted and implemented by agencies and utilities for decades without problems. Contrary to the assertions by some, we are unaware of any state enforcement agencies that have expressed concerns about difficulties in implementing the NSPS emissions rate increase test since it was established in 1971. Indeed, before late 2005 (when this preamble statement was issued), no one – either within or outside EPA – had ever expressed a concern with the enforceability of the NSPS emissions increase test, which has been on the books and has been implemented by EPA and the states for more than three decades. Utilities have long been able to establish whether a project might affect a unit's maximum achievable hourly emission rates (kg/hour) by, for example, measuring or evaluating parameters that are directly related to emissions rates, such as steaming rates or coal-burning capacity. For example, in the WEPCo matter, the Agency and the Company readily agreed to measure the unit's steaming rates before the project to determine whether restoration of the unit's capacities would increase their maximum hourly emissions rates. We acknowledge that a variety of ambient and equipment parameters can affect what is actually achieved on a particular day. For example, heat input at full load can vary a significant amount due to, for example, cooling tower temperature. But so long as the same conditions are considered before and after a project, it is readily feasible to evaluate whether a particular project will affect a unit's emissions rate.

Given the relatively straightforward means available to establish a unit's achievable hourly emission rate, we disagree with the assertion that a permitting authority would have an exceedingly difficult time assessing whether or not a change at an EGU triggered NSR and that this would then lead to a “battle of the experts” and handicap the efficient administration of a pre-construction permitting program.

As explained above, a utility can readily provide information as to how it established an EGU's maximum hourly achievable emission rate, and an enforcement authority is free to challenge any of the inputs. Unless an enforcement authority is extremely litigious, however, there should not be much call for experts to battle about parameters that are readily measured or susceptible to straightforward engineering evaluation at most power plants. While what may be deemed a "representative" maximum heat input level or steaming rate may be somewhat less black and white, it is not more complicated than a variety of other CAA/NSR concepts.

Moreover, we question the basis for the critics' hand-wringing about a "battle of the experts" if the test is based on maximum achievable emissions rates. The critics' argument suggests, without explicitly stating it, that the current emissions increase test – the annual, actual-to-projected-actual test – is somehow free of doubt or "expert" disagreement. In fact, even the most cursory review of the voluminous expert reports filed in every NSR enforcement case since 1999 (*e.g.*, TVA, Ohio Edison, SIGECO; AEP; Duke Energy; Cinergy; EKPC) demonstrates that the actual-to-projected-actual test is subject to much more elaborate "battles of the experts" than the maximum hourly emissions test can ever be. Indeed, while the latter depends only on an engineering assessment of the unit's capability before and after a project, the former depends on that same factor along with myriad other, more complex factors, such as demand forecasts on the system and the unit, dispatch economics and modeling, the status of other units on the system, off-system sales, etc.

D. Concerns Over the Paucity of NSPS Violations

Building upon the fact that the NSR hourly emission rate increase test is consistent with the longstanding NSPS emissions rate increase test, critics of the NSR hourly test suggested -- at EPA's public hearing -- that one way to evaluate the enforceability of an NSR hourly emission rate increase test would be to evaluate whether any companies have triggered NSPS in the past. Knowing that few, if any, companies have triggered applicability of the NSPS program, they want to conclude that means the NSPS program is not enforceable. In fact, companies rarely trigger the NSPS program because they modify their behavior (*i.e.*, they avoid undertaking projects) so as to avoid

triggering the NSPS rules.¹¹ The director of EPA's Office of Air Quality Planning and Standards wrote in 1996 that "no existing utility unit has become subject to the utility NSPS under either the modification or reconstruction provision."¹² And EPA has not found hoards of NSPS violations in the course of OECA's utility enforcement initiative.¹³

In short, the absence of NSPS violations indicates that utilities operating in a highly regulated environment with clearly written Agency rules applying only when there is a kg/hr increase in the emissions of regulated pollutants will comply with those clearly written rules by modifying their behavior and avoiding projects where there might be any kg/hr emissions increase. Contrary to critics' suggestions, this is the way regulatory programs are supposed to work: communicate ascertainably certain standards through clear and transparent regulatory language, so that regulated entities can readily conform their conduct to the rules.

E. Claims Relating to the Need for More Emission Reductions

Some critics of EPA's proposal for a maximum hourly emissions rate increase test try to undercut the Agency's proposal by claiming that a more stringent NSR applicability test is needed to address specific air quality problems remaining in parts of the country. In response, the October 2005 preamble discusses in several places the

¹¹ The only example we can recall where a *proposed* utility project would have triggered NSPS was at WEPCo's Port Washington plant. In that example, though, after the Seventh Circuit agreed that the proposed project would trigger NSPS at Unit 5, the company shut the unit down because the costs of complying with NSPS would have been prohibitive. For the other two units that the court found would have triggered NSPS if implemented as initially proposed by WEPCo, the company implemented minor adjustments to the units' emissions controls so as to *avoid* triggering NSPS. See Letter from W.G. Rosenberg, EPA Assistant Adm'r for Air and Radiation, to J. Boston, President, WEPCo, at 10 (June 8, 1990); Memorandum from G.A. Emison, Director, office of Air Quality and Standards, to W.G. Rosenberg, EPA Assistant Adm'r for Air and Radiation (May 25, 1990) (discussing EPA's settlement with WEPCo).

¹² Letter from John S. Seitz, Director OAQPS, to Senator Robert C. Byrd (January 26, 1996).

¹³ Although EPA has several times made allegations of violations of NSPS in OECA's utility enforcement initiative, most of those claims have been dropped during discovery.

significant improvements in air quality that have resulted or will result from implementation of several non-NSR CAA programs including the Acid Rain Control Program, the NO_x SIP call, CAIR, and BART, which all mandate large reductions in emissions from EGUs.

As discussed in section II of these comments, UARG believes that the legal basis for EPA's plan to develop a maximum hourly emissions rate test for NSR applicability is not tied to the fact that these other CAA programs exist and are successful, nor is EPA's proposal flawed because it does not address all the remaining air quality problems in this country. Nevertheless, we believe it is important to correct some of the misinformation that exists concerning the effectiveness of the other EPA-identified emission reduction programs. In particular, it is important to respond to critics' claims that after the implementation of various non-NSR emission reduction programs, some areas will remain in nonattainment. Even if this is true in some areas, the CAA's NSR program is not the remedy for that situation.

EPA has done studies that predict that after implementation of the extensive regional air pollution production programs mandated by the Clean Air Act (*e.g.*, the Acid Rain Control Program, NO_x SIP Call, CAIR, and BART), the number of remaining nonattainment areas will dwindle and the cause of those remaining nonattainment areas will be due more to localized conditions or sources. At that point, if a nonattainment area remains in a state, the appropriate response for that state under the Clean Air Act is to use air quality data and modeling tools to identify the causes of the continuing nonattainment. Once the sources contributing to nonattainment are identified, the state's implementation plan can be crafted to mandate emission reductions from the emission-contributing sources, regardless of their age. As Congress envisaged, this is the direct and appropriate way to address the nonattainment concerns expressed by program critics. Twisting the NSR program to try to do this would usurp the discretion Congress accorded the states in deciding how to achieve attainment of the national ambient air quality standards.

Those criticizing the October 2005 preamble seem to have a misconception that the primary purpose of the major NSR program is to reduce emissions, a view that is inconsistent with the CAA, the legislative history, and the regulatory history. EPA has rejected such a view and has emphasized that the program is intended "to minimize

emissions increases from new source growth.” 70 Fed. Reg. at 61088, col. 1. We agree with EPA’s interpretation of the CAA as showing “that Congress intended the modification definition to apply to expansions in capacity, but not to apply to the use of existing capacity.” *Id.* at 61099, col. 1; *see also id.* at 61095, col. 2 (“[A]t a minimum, Congress was concerned about regulating new sources of emissions caused by expanded or modified capacity” through the new source programs.).

V. CONCLUSIONS

UARG supports EPA’s plans to propose rules that will, at least for utility sources, limit NSR preconstruction permitting of projects at existing emission units to those that are “modifications” under EPA’s NSPS program. UARG believes this approach is fully consistent with the requirements of the CAA and with the recent court decisions interpreting the NSR provisions of the Act.

**ANALYSIS OF THE UPPER TOLERANCE LIMIT
PROCESS PROPOSED BY EPA FOR DETERMINING THE
“MAXIMUM ACHIEVED HOURLY EMISSIONS RATE”
FOR ELECTRIC GENERATING UNITS**

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August 6, 2007

ATTACHMENT 1

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1 Summary

EPA has proposed a process for determining if an electric generating unit (EGU) exceeds its pre-change “maximum achieved hourly emissions rate” by utilizing an upper tolerance limit process developed by the National Bureau of Standards. This process is governed by the following equation

$$UTL = \bar{x} + s * \left[\frac{Z_{1=p} + \sqrt{(Z_{1=p})^2 - \left[1 - \frac{Z_{1=q}^2}{2 * (n-1)}\right] * \left[Z_{1=p}^2 - \frac{Z_{1=q}^2}{n}\right]}}{1 - \frac{Z_{1=q}^2}{2 * (n-1)}} \right]$$

The variables in this equation are the mean emission level, its standard deviation and the population of the dataset. EPA has proposed utilizing the following process to estimate whether an EGU has increased its maximum hourly emissions after a change. The process is as follows:

1. Determine the highest heat input year from 5 years of CEMS or PEMS data prior to a proposed change;
2. Sort the data based on heat input rates and eliminate the lower 90 percent of the data;
3. Calculate the UTL given by the equation above and establish this as the maximum emission rate;
4. Compare this emission rate to each hourly emission rate post-change; and
5. An emission increase would result if the hourly post-change emissions rate exceeded the UTL emission level.

EPA hypothesized that this process captured the natural variability of EGUs emissions and would insure that the pre-change maximum achieved hourly emissions rate would not be exceeded simply by random variability of the system. Analyses were performed to determine if this process was viable for realistically comparing pre-change and post-change hourly emissions rates and to test EPA’s hypotheses. These analyses utilized actual CEMS data from 9 coal-fired EGUs. The analyses tested the usefulness of various variations to the UTL process, including some proposed by EPA, to attempt to improve the process. These analyses evaluated the following variations to the proposed UTL process:

1. Data sorting by heat input prior to applying the UTL process (the method proposed in the Federal Register notice);
2. Data sorting by pollutant species (NO_x and SO₂ emission rates) prior to applying the UTL process;
3. Variation of the statistical parameters;
4. Variation of the size of the filtered dataset;

5. Evaluation of an equivalent post-change dataset population (highest 10 percent of data, based on heat-input sort); and
6. Elimination of potential anomalous readings through statistical removal of outliers.

The basic finding of these evaluations was that EPA's proposed UTL process does not support EPA's hypotheses. The underlying cause for this failure to support the hypotheses is that the UTL process uses a statistical process with a given level of confidence and a relatively large pre-change dataset to compare against one hour emissions data post-change. In order for this process to be viable, either the pre- and post-change datasets must be similar or the confidence level must be extremely high (close to 100 percent). The highest post-change hourly emissions data point essentially represents the far right portion of the normal distribution tail. Any confidence level less than 100 percent would potentially cause an emission exceedance.

All of the analyses performed herein showed that EPA's proposed UTL process cannot be made to satisfy the EPA hypotheses based on actual EGU CEMS data. For any of the variations to the process listed above for the 2006 dataset, the best that could be achieved was that only 5 of the 9 units would not exceed the UTL utilizing the same set of data before and after change. This result was for a post-change dataset equal to the pre-change dataset, i.e., 10 percent highest heat-input points of the highest 365 day emissions. Utilizing post-change 2006 hourly emissions data (as proposed by EPA) resulted in all 9 units exceeding the UTL. These results clearly show that the EPA proposed UTL process for this application is flawed and would ensure that virtually all units subject to this process would have false positives, i.e., show emission increases where no increases have actually occurred. Analysis of the EPA UTL process for the five year datasets further confirmed that the process would show that the majority of units would have increases in emissions (false positives) by this method.

A slight revision to EPA's proposed UTL process results in fewer EGUs having false positives than that for EPA's original proposal. The revision more closely satisfies EPA's hypotheses stated in the Preamble. The revised UTL process follows the following steps:

1. Perform a 168-hour rolling average of the 5-year pre-change emission data,
2. Calculate the UTL based upon these 168-hour rolling averages,
3. Utilize the highest UTL to compare against the hourly emission data post-change.

This revised UTL process results in only 2 of the nine units having false positives for NO_x and 3 for SO₂. This compares to 7 units for NO_x and all nine units for SO₂ having false positives for the EPA proposed UTL process. But because even this revised UTL process does not eliminate false positives altogether, additional steps should be used to account for these false positives. For example, the following two steps can be added:

4. Test the pre-change hourly emissions for false positives, and
5. In determining whether there has been a significant increase in emissions after a change, allow as a safe harbor the number of hourly false positives that occurred during the pre-change period.

2 Introduction

On May 8, 2007, EPA published a supplemental proposal for a revised emissions increase test for electric generating units (EGUs) (72 Fed. Reg. 26202-227). This supplemental proposal includes a new statistical alternative that calculates a maximum “achieved” hourly emission rate on either an input- (lb/hr) or output- (lb/MW-hr) basis that cannot be exceeded for even a single hour during the five years after a project is undertaken. This calculated maximum achieved emission rate is based on actual emission data for the five years prior to a proposed change at the EGU. The statistical process is based on the upper tolerance limit statistical process (UTL) developed by the National Bureau of Standards (Ref. 1). This proposed UTL statistical process is represented by the equation below:

$$UTL = \bar{x} + s * \left[\frac{Z_{1-p} + \sqrt{\left(Z_{1-p}^2 - 1 - \frac{Z_{1-q}^2}{2 * (n-1)} \right) * \left(Z_{1-p}^2 - \frac{Z_{1-q}^2}{n} \right)}}{1 - \frac{Z_{1-q}^2}{2 * (n-1)}} \right] \quad \text{Equation 1}$$

Where:

\bar{x}	=	Mean value of the dataset,
s	=	Standard Deviation of the dataset,
Z_{1-p}	=	3.090, Z score for the 99.9 percentage of the interval,
Z_{1-q}	=	2.326, Z score for the 99.0 percent confidence interval.

EPA believes “the statistical approach properly accounts for the variability inherent in EGU operations and air pollution control technology.” 72 Fed. Reg. 26215, col. 3. Further, EPA believes that this statistical process “helps to ensure that the emissions from an EGU will not exceed its pre-change maximum achieved hourly emissions rate simply through the random variability of the system” 72 Fed. Reg. 26215, col. 3. EPA has proposed the values of the Z_{1-p} parameter and the Z_{1-q} parameter above but requests comment on whether it would be appropriate to set these two parameters at lower levels of 90.0 percentage of the interval (Z_{1-p}) and either a 90.0 or 95.0 confidence interval (Z_{1-q}). This paper concentrates on the original proposed values of both Z_{1-p} (99.9%) and Z_{1-q} (99.0%) since these represent UTL values that would be higher than those for the other intervals. The impact of using higher values for these two parameters was also evaluated.

EPA’s statistical process can only be applied to EGUs that are equipped with CEMS or PEMS. This paper only evaluates datasets from CEMS since most utility units above 25

MW have installed CEMS for NO_x and SO₂. EPA's proposed UTL process begins by evaluating five years of CEMS data prior to the proposed change and selecting 365 contiguous days of data (not necessarily in the same calendar year) representing the highest heat input period for the EGU during the previous five years. The dataset is filtered to delete emissions data for periods of start-up and shut-down, periods of malfunction and periods of non-compliance with the appropriate emission limitations. Next these data are sorted by heat input and the highest 10 percent of the dataset are selected. For the rest of the analysis, under the proposal, the NO_x and SO₂ emissions rates are utilized to determine the mean and standard deviation of the datasets and each is substituted into Equation 1 along with the number of data points used in the analysis. The UTL values of NO_x and SO₂ derived from this process establish the pre-change maximum achieved hourly emission rate for these pollutants. These levels will later be compared to the highest hourly emission rates during the five years after the project. As with the pre-change data, periods of start-up and shut-down, periods of malfunction and periods of non-compliance with the applicable emission limitations are eliminated from the hourly data before determining the maximum post-change hourly emission rate. According to the proposal, any remaining hourly rate above the UTL value during the five years after the project would be deemed to be an increase in the hourly emissions rate, potentially triggering new source review (NSR).

EPA has also requested comments on the advantages of using the UTL process by first sorting on the emission rate of the actual specie (NO_x and SO₂ in this case) rather than sorting on the heat input to obtain the highest 10 percent of the hourly data. This paper addresses the advantages and disadvantages of this alternative sorting approach.

There are a number of uncertainties and limitations relative to how certain types of emissions data are handled by the proposed EPA process. These include, but are not limited to, the following:

1. Data for EGUs whose emission controls operate seasonally, e.g., only during the ozone season;
2. Data for common stack EGUs;
3. Elimination of periods of non-compliance:
 - a. Applicable emission limits may be based on averaging periods greater than one hour;
 - b. An hourly emission level higher than the applicable limit may not cause an actual non-compliance event due to trading, averaging or other compliance approaches;
4. How a malfunction is determined.

This paper provides insight into the efficacy of the UTL approach for single stack utility coal-fired EGUs¹ unit that operate with the same pollution control equipment throughout the entire year. Therefore, issues 1 and 2 do not come into play. The issue of elimination of non-compliance periods is not addressed here since the units selected for analysis comply

¹ EPA's proposed rule would apply to all fossil-fired EGUs, including electric utility steam generating units and combustion turbines. The analysis in this paper focuses on 9 coal-fired EGUs.

with their emission limitations, which are typically set for averaging periods greater than one hour. It is assumed in this analysis that none of the units had periods of non-compliance. As reported to EPA, none of the data used here is identified as resulting from a malfunction of pollution control equipment, the EGU or CEMS. Nevertheless, it may be that some of the outliers are due to such malfunctions. Accordingly, the effect of removing from the datasets potential malfunctions is evaluated by analyzing “filtered” datasets in which statistical outliers are eliminated.

3 Analysis Methodology

The following paragraphs discuss the unit selection process for the UTL analyses, the UTL analysis process, and potential variations of this process.

3.1 Unit Selection

CEMS data from nine coal-fired EGUs were obtained from the EPA Electronic Data Reporting (EDR) site. DOE data were used to ascertain the basic attributes of the population of coal-fired EGUs for those units operating during the year 2005 (2006 was not available). From this 2005 DOE database, units were selected that had the following attributes:

1. High utilization or hours of operation in 2005;
2. NO_x emissions representative of two control technologies:
 - a. Selective Catalytic Reduction (SCR), below 0.1 lb/MMBtu, and
 - b. Combustion controls, between 0.5 and 0.4 lb/MMBtu;
3. Units with both wall- and tangential-firing unit designs;
4. Units with single stack CEMS;
5. Different coal types (bituminous and sub-bituminous); and
6. Different SO₂ control processes (spray and venture scrubbers).

Using these criteria, nine coal-fired EGUs described in Table 1 below were selected.

These units are generally representative of coal-fired EGUs commonly used in the United States. The combustion-controlled and the SCR-controlled units have very different NO_x characteristics. Furthermore, combustion-controlled, wall- and tangential-fired units have different characteristic NO_x curves relative to load. In addition, the bituminous and sub-bituminous-fired units generally have very different levels of NO_x emissions. The SO₂ controls include spray and venturi sulfur oxide removal processes. The purpose of using the units listed in Table 1 was to analyze a cross-section of utility units to gain insight into whether the UTL process was sensitive to these parameters, i.e., coal type, unit type, NO_x control type and, to the extent possible, sulfur oxide control type. In addition, other parameters such as sample size and confidence intervals were also analyzed.

3.2 Evaluation of EPA UTL Process

The purpose of the analysis of the nine selected units listed in Table 1 was to test the hypothesis that EPA established in its proposal, i.e., that the UTL method provides a reasonable maximum “achieved” hourly emission rate that accounts for the normal variability of EGU emission data. It tests EPA’s statement that the UTL process “helps to ensure that the emissions from an EGU will not exceed its pre-change maximum emission rate simply through random variability of the system.” Initially, to test these hypotheses,

EDR data from calendar year 2006 was downloaded from the EPA EDR website for each unit. These data were then subjected to the process delineated by EPA to determine the UTL based on Equation 1. Next, the assumption was made that, in the future after a hypothetical physical or operational change that occurs at the unit after 2006, these units would operate identically (loads, emissions, hours, etc) as they did in 2006. The hypotheses were tested by assuming that the UTL process accurately established the maximum achieved hourly emission rate during the 365 day baseline period and that during the subsequent five years, the unit will be operated identically to the five years before the project. That is, these units were assumed to have undertaken a change in the interim that, in fact, had no effect whatsoever on the units' emissions profile for the entire year. The analysis seeks to determine whether there are any occurrences of hours where the maximum achieved emission rate is exceeded. Any such false positives would indicate a flaw in the statistical procedure, because NSR would be triggered even though there had been no change whatsoever in the emissions profile at the unit. The CEMS data analyzed are for NO_x Method Code 1 or 2 EDR data and all SO₂ data which represent only actual emissions – no substituted data were used.

The UTL analyses were performed exactly as described in the proposal for the EPA UTL methodology together with several other variations of this process. These variations were for various sample sizes (1 to 10 percent), tolerance levels ($Z_{1-q} = 99.0$ to 99.9) and various percentages of the interval ($Z_{1-p} = 99.0$ to 99.98 percent). Also, since it was not possible to extract any potential unreported malfunctions of the unit or the pollution control equipment from the CEMS data, a parallel analysis was done to eliminate potential outliers. This outlier process eliminated any emissions from the 365 day dataset that were above three standard deviations from the mean.

These variations to the EPA-proposed UTL process were undertaken to evaluate the impact of the independent variables in the UTL procedure. All of the following analyses were performed to determine if the proposed UTL process was viable for evaluating post-change maximum hourly emission rates and to investigate whether adjustments to the process would improve this evaluation so that no false positives would result. Subsequent to this initial assessment, five years of CEMS data from 2002 through 2006 were also analyzed (this additional analysis is discussed in section 5.4).

4 EPA UTL Process Results

Two sets of analyses were performed utilizing the procedure delineated in EPA's supplemental proposal. The raw datasets from the nine units were analyzed first. A second set of analyses was performed by removing potential outliers. The outlier criterion assumed that any emissions data above three standard deviations from the mean emission level were anomalous and were removed before sorting the data by heat input. It is believed that these two sets of data bound the solution. The upper bound being the unfiltered dataset and the lower bound being for the dataset with potential outliers removed.

4.1 Evaluation of Unfiltered Datasets

Table 2 below shows the results of the analysis for the unfiltered dataset for both NO_x and SO₂. The column labeled "False Positives" represents the number of times the full 365 day dataset had hourly emission values above the UTL value.

As can be seen in Table 2, only one unit (Unit B) shows no false positives. Most of the units had varying amounts of false positives. For NO_x, this ranged from 1 to 129 hourly NO_x false positives. For SO₂, this ranged from 1 to 687 SO₂ false positives. Potentially, some of these exceedances could have been the result of outliers that may not be representative of normal variations in unit performance and control and measurement processes. The results for this unfiltered case should be considered as the upper bound of the potential exceedances.

The National Bureau of Standards UTL equation was developed for datasets that are normally distributed (Ref. 1). The Shapiro-Wilks (W) coefficient is a measure of the normality of a distribution – 1.0 being normal and those below potentially being non-normal. Datasets with W close to 1.0 could reasonably be considered normally distributed. The SO₂ rate datasets for the units analyzed have Shapiro-Wilks (W) coefficients which are generally around 0.97, however three units have a W coefficients of 0.438, 0.766 and 0.862. Similarly, the NO_x-rate W coefficients are generally around 0.97, but three are 0.438, 0.871 and 0.904. These low-coefficient units may have datasets that depart significantly from a normal distribution. In a perfectly normally distributed emission dataset, there would not be a finite maximum emission rate. However, there is a practical maximum emission rate dependent on the uncontrolled emission level and the amount of coal burned. Whether the actual distribution is normally distributed or not does not assure that the EPA hypotheses are valid. At the 99.9 percent confidence interval, the potential for over 400 false positives are possible in a five year period. Therefore whether the distribution is normal or not cannot significantly change the results since the tolerance limits establish the potential for exceeding the UTL. The only way to insure that the UTL process will satisfy the EPA hypotheses is to set the tolerance level extremely high (99.9977 % for one exceedance in 5 years). This will be illustrated in the analyses provided in Section 5. The normality of the emissions dataset may have less impact on

the attainability of the UTL method than the actual confidence levels used to set the UTL. The statistics for these 18 emission datasets are included in Appendix A.

4.2 Evaluations of Datasets with Outliers Removed

To set a lower bound for the potential failures of the UTL process, an outlier removal process was used on the datasets for the nine units analyzed above. As a surrogate for removing potential anomalous outliers, all emissions data above three standard deviations were removed from the datasets for the nine units. Table 3 shows the results for this lower bound analyses.

Even with the potential outliers removed, eight of the nine units still have many false positives after a hypothetical change at the unit. These filtered results (outliers removed) should be considered the lower bound of the potential false positives.

5 Evaluation of Adjustments to the EPA UTL Methodology

There are a number of adjustments to the proposed UTL methodology that might reduce the number of false positives found in Tables 2 and 3 above. EPA has suggested two possibilities:

1. Utilize the UTL methodology by sorting data by the pollutant (NO_x or SO₂ rate) rather than the heat input; or
2. Change the statistical parameters related to the confidence interval and percentage of data.

The following sections provide analyses related to changes that may improve the UTL process.

5.1 Results for UTL Method Sorted by Pollutant Emission Rate – Unfiltered

Analyses similar to that in Section 4.0 were performed to evaluate the effect of sorting the initial datasets by NO_x and SO₂ rates (instead of heat input) before eliminating the lower 90 percent of the data. From a phenomenological point of view, this makes much more sense than sorting by heat input. It is not necessarily true that high heat input translates into measured high emissions rates. It would make much more sense to sort by pollutant emission rate since that is what is used in the “After” change period to assess whether or not the UTL was exceeded. Table 4 shows the results of applying the UTL process on the datasets sorted by NO_x and SO₂ rates.

The major difference between these results and those shown in Table 2 are:

1. The single unit that did not have a false positive now had some; and
2. The overall, total number of false positives decreased dramatically.

While there were as many as 134 NO_x false positives for the methodology as proposed (i.e., sorting by hourly heat input rates), the maximum number of false positives for this adjustment resulted in a maximum of 28. Similarly, there were 682 SO₂ false positives for the methodology as proposed and only a maximum of 42 for the adjusted methodology. It appears that this methodology would be closer to satisfying EPA hypotheses than sorting by heat input. Nevertheless, none of the units were able to operate without triggering false positives for either NO_x or SO₂.

5.2 Results for UTL Method Sorted by Pollutant – Outliers Removed

To bound the potential false positives, the data for the pollutant-sorted analyses were performed for datasets with the outliers removed. All emissions data for NO_x and SO₂

emissions rates above 3 standard deviations from the dataset mean were eliminated. The UTL process was then performed on the remaining dataset. Table 5 shows the results for this filtered dataset.

As with the unfiltered data, none of the units were able to avoid false positives for both NO_x and SO₂. Again, it appears that this methodology would be closer to satisfying EPA's hypotheses than sorting by heat input. The maximum number of false positives for any unit for NO_x went from 28 to 18 and the maximum for SO₂ went from 42 to 11 by eliminating the outliers. But none could simultaneously avoid triggering false positives for both NO_x and SO₂.

5.3 Results for UTL Methodology with Equivalent Highest 10% Hourly Heat Input Post- Change Dataset

Currently, the process proposed by EPA calculates a UTL value based on 10 percent of the available data (sorted on the basis of heat input) in a 365 day period before a change and compares it to hourly data for the entire 365 day period after the change. It seems inappropriate to compare different populations of data before and after a change, since the UTL is determined for emission rates, not heat input rates. An adjustment that could make the UTL process more reasonable would be to compare the same type of data "before" and "after" the change. This adjustment would compare the hourly emission data from the highest 10 percent (sorted on the basis of heat input) of the dataset "after" the change to the UTL calculated on the basis of the highest 10 percent heat input dataset before the change. This would ensure that the before and after change datasets were based on the same sorting criteria.

Table 6 summarizes the results of this analysis. Columns 5, 6, 9 and 10 show the results for the UTL process using only the highest 10 percent of the heat input dataset, both for calculating the UTL and in the "after-change" dataset, for both unfiltered and filtered (outliers removed) datasets. For comparison purposes, columns 3, 4, 7 and 8 show the results for the UTL process using all of the emissions data "after" the change for both unfiltered and filtered datasets (i.e., using EPA's proposed sorting and comparison methods, as described earlier in section 4).

These results show that limiting the datasets before and after the change to the same highest 10 percent of heat input data improves the possibility of avoiding false positives. This is an improvement in the process, but some units still trigger false positives.

5.4 Evaluation of the Impact of Independent Variables

The independent variables that can be changed in the EPA UTL formula are:

1. Z_{1-p} , the percentage of the interval;
2. Z_{1-q} , the percent confidence interval; and
3. N , the percentage of the 365 day period used.

Since the analyses performed to this point have shown that setting the parameters at those proposed by EPA result in false positives at eight of the nine units analyzed, it is evident that the Z_{1-p} and the Z_{1-q} values must be increased, rather than decreased as suggested by EPA, to obtain more reasonable results. For the sake of illustration, the maximum for these parameters will be set at 99.98 percent which represents approximately 2 potential false positives per year. The following shows the impact of a range of these values:

1. Z_{1-p} from 99.0 to 99.98 percent
2. Z_{1-q} from 90 to 99.98 percent

Figure 1 shows the impact of these parameters on the standard deviation in the UTL equation.

The middle (red) line represents the EPA-proposed value for the percentage interval. The bottom (blue) line represents an alternate that EPA has suggested. Obviously, since the UTL as proposed results in many false positives, the lower values of these parameters are not appropriate. Comparing the low end factor for the data interval (99.0 %) with the high end value of the data interval (99.98 %) shows that the maximum increase in the standard deviation coefficient is approximately 18 percent. For some of the units, this is not sufficient to avoid false positives. Therefore, the only other independent variable to change would be the size of the dataset. Currently it is set at 10 percent of the 365 day period. Based upon the UTL equation, decreasing this parameter would increase the standard deviation multiplier and possibly allow all units to avoid false positives.

Decreasing the percentage of the 365 day data used to calculate the UTL also changes the value of the standard deviation. The results for simply decreasing the amount of data analyzed are shown below in Figure 2. This figure shows that as the size of the dataset is decreased, the standard deviation multiplier increases. For the sake of setting a lower bound for these parameters, one could analyze only one percent of the data and employ a 99.98 confidence interval. This would likely decrease the number of false positives provided that the standard deviation itself did not decrease drastically as well. Table 7 shows the results of these analyses for filtered datasets comparing the NO_x and SO_2 UTL before change to the highest hourly emissions rate after change and also to the highest emission rate for 1 percent of the data after change.

The number of false positives was determined for the nine units for the case where only one percent of the data was used in the UTL determination. For the analysis comparing all of the hourly emission data after change, 3 units had NO_x false positives and 4 units had SO_2 false positives. For the analysis for 1 percent of the highest heat input data after change, 1 unit had NO_x false positives and the same unit had a SO_2 false positive. This latter analysis method, using 1 percent of the data before and 1 percent after, comes very close to satisfying the EPA hypotheses.

5.5 Evaluation of Pre-Change Five-Year Operating Period

The following analyses utilize five years (2002 to 2006) of emission data for the 9 units. Previous sections concentrated on the statistical nature of the process. The following provides insight into the year-to-year variation of the UTL and also provides analyses of the UTL process for the original proposed methodology (i.e., using 5 years worth of data, instead of just one year -- 2006).

5.5.1 Evaluation of Calendar Years Against Highest Heat Input Year

The previous analyses compared the 2006 pre-change UTL against the same dataset post-change. The following analysis compares the UTL for the highest heat input calendar year against the 4 other calendar years and against the highest heat input calendar year as well. Table 8 shows the results of these analyses. This table illustrates several shortcomings of EPA's proposed method using the 10 percent highest heat input for a 365 calendar day period against hourly emissions for the calendar year ("All Data After" columns). In addition, results are shown in Table 8 for an analysis in which the UTL process is modified by using the same 10 percent of the highest heat input both pre- and post-change data ("10% Data After" columns). The data shown in Table 8 is for the unfiltered emission data (no outliers removed).

In addition to the fact that it was previously shown that the process may not be viable due to basic statistical issues, the major shortcomings that become evident as a result of the five-year period analyses are briefly summarized below:

1. The highest UTL year for NO_x is not necessarily the highest year for SO₂ for 4 of the 9 units as illustrated by the green shaded data.
2. Maximum emissions in calendar years other than the highest UTL calendar year cause false positives for 4 of the 9 units as illustrated by the yellow shaded data, i.e., the highest UTL year did not capture the highest emission rate.
3. The UTL varies significantly for year to year.

Utilizing a sort by pollutant (EPA's alternate approach) would potentially solve item 1 above. It would not solve the issues related to other years with maximum emissions greater than the highest UTL year during the five year period.

5.5.2 Evaluation of Highest Heat Input Year Against 5-Year Hourly Emissions

Analyses were performed for the exact UTL process proposed by EPA for the five year period from 2002 to 2006 (i.e., assuming a change that is undertaken at the end of 2006). The highest heat input year was determined from this five year dataset irrespective of the calendar year. The UTL calculated from this highest year established the maximum NO_x and SO₂ emission rates. Figures 3 and 4 illustrate this process for Unit E1. Appendix B contains similar plots for the other 8 units analyzed. Tables 9 and 10 show the results for

the proposed methodology sorting on heat input for the dataset with all EDR emission data (no exclusions) and for the same dataset with potential outliers removed, respectively.

For this analysis the five-year period was assumed to be exactly the same for pre-change and post-change. That is, each unit was assumed to operate identically in all respects in the 5 years after a hypothetical change undertaken at the end of 2006 to the way the unit operated before that change. Table 9 shows that 7 out of the 9 units had false positives for NO_x and that all had false positives for SO₂.

Table 10 illustrates the same results for the emission dataset filtered to eliminate potential outliers. For this filtered dataset, 5 out of the 9 units had false positives for NO_x and 7 out of 9 had false positives for SO₂. Two units (B5 and D4) had no false positives for either NO_x or SO₂. Consequently, 7 out of the 9 units had false positives for either NO_x or SO₂. While this shows that some units could meet the test, the majority would not.

For the alternate methodology suggested by EPA, the emission data were sorted by species (NO_x or SO₂ emission rates) and the highest 365 day period for these were used to set the UTL maximum emission level. Tables 11 and 12 show the results for unfiltered and filtered emission datasets, respectively. Similar to the heat-input sorted results (Tables 9 and 10), the majority of the units had false positives. For the unfiltered dataset (Table 11), all units had false positives. For the filtered dataset (Table 12), all but one unit had false positives. As with the heat-input sort methodology, the emission rate sort alternative methodology resulted in the majority of the units having false positives.

Shortening the sorting period to one percent and changing the basic statistics to 99.98 percent confidence interval potentially would be a method for improving the UTL process. EPA appears to have selected the ten percent sorting criterion as a way to characterize the emissions rate of a unit at maximum output. If that is the case, one percent would be even more characteristic of the emissions rate of the unit at maximum output.

The NSR consequences of an EGU failing the NSR test are much greater than those for rulemakings in which an emission rate standard (or limit) is set, such as NSPS. Therefore, if EPA uses a statistical method, such as the UTL process, to determine whether there has been an increase in the hourly emissions rate after a project, it is extremely important to assure that the UTL process does not show false positives for the population of EGUs. For the nine units analyzed, EPA's proposed statistics for the NSR test may result in as many as 124 and 425 false positives in five years for either NO_x or SO₂, respectively. Unlike the exceedance of an emissions limit, such as an NSPS, failure of the NSR test for a significant emission increase has potential monumental costs associated with retrofits of costly control equipment. One failure of the test could result in the EGU being required to retrofit controls costing many hundreds of millions of dollars. Since the current statistics (99.9 and 90.0 %) have the potential to fail the test numerous times, the statistics should justifiably be increased to allow fewer potential exceedances. For one exceedance in five years, the confidence interval would have to be set at 99.998 percent. EPA has in the past established a 1 violation of the NSPS in 10 years criterion. For 24 hour block days, this amounts to a confidence interval of 99.9726 percent which was used in the 1978 NSPS and subsequent rulemakings (References 2, 3, 4 & 5). Had the 1978 NSPS been on an

hourly basis, the confidence interval would have been set at 99.9989 percent for one hourly violation in 10 years.

Table 13 and 14 show the results for the data sorted by species for a one-percent sorting criterion and a confidence interval of 99.98 for both unfiltered and filtered data, respectively. While this decreases the number of units that have false positives, still only two units can have no false positives for both SO₂ and NO_x.

The process analyzed above is exactly that proposed by EPA. The results show that a majority of the units analyzed could not operate without false positives regardless of the sorting method, statistics or population size.

5.6 Evaluation of a Revised UTL Calculation Process

EPA proposed to utilize a two step process for calculating the upper tolerance limit for EGU emissions. The first step was to identify the highest 365 day period for either heat input or NO_x and SO₂. The second step was to determine the highest 10 percent of the values for these parameters and calculate the UTL based on this 10 percent population. By selecting only the highest values of the parameters within the 365 day period, the process effectively distorts the natural variability of the data during that period. It essentially minimizes the standard deviation of the data (variability) and causes the UTL to be lower than that for the actual 365 day dataset. This process makes the UTL artificially low particularly when it is to be tested against hourly data after the change.

An improvement to eliminate this artificially low UTL would be to calculate it using all of the data in the highest period. In the case of the EPA proposed methodology, this would be for the entire 365 contiguous days. The disadvantage of utilizing this large population (8760 hours) is that it masks the true normal response of a utility EGU. Utility EGUs have both diurnal and weekly variation depending upon the time of year. These variations within a day or a week can be much greater than those represented by an annual average and significantly greater than the highest 10 percent of the annual average. Therefore, a more realistic time period for selecting the highest emissions would be in the order of a week (168 hours). This captures both the diurnal and weekly variations that typical utility EGUs experience during the year. Utilizing the UTL calculated on this basis likely would more closely fit the hypotheses stated by EPA in the preamble.

The methodology for this revised UTL process would be to first determine the rolling average 168-hour periods for both NO_x and SO₂ during the 5 years prior to the change. Then determine their UTLs based upon the statistics for these periods. And finally, select the highest UTL for the two species and utilize this value to compare against the hourly NO_x and SO₂ emissions levels after the change. Since this revised process and the UTL process proposed by EPA both have the potential for resulting in false positives of the NSR test, a test for internal consistency should be utilized to prevent false positives that might have actually occurred during the before change period. As a check against internal consistency, the number of false positives would be determined for the five year period prior to the change. The resulting number of false positives determined in the before

change period would then be allowed for the 5-year period after the change. If the number of measured hourly emissions rates that exceed the UTL in the 5 years after the project is not more than the allowed number of exceedances, there is no increase in the maximum achieved hourly emissions rate.

Figures 5 and 6 show the 168-hour UTL process described above for Unit E using the statistics proposed by EPA, i.e., $Z_{1-p} = 3.090$ for the 99.9 percentage of the interval and $Z_{1-q} = 2.326$ for the 99.0 percent confidence interval. As can be seen from the figures, the maximum UTL values for NO_x and SO_2 for this process were 6007 and 1658, respectively. Utilizing these UTL values resulted in no false positives for NO_x and 15 false positives for SO_2 . This compares with 41 false positives for NO_x and 425 false positives for SO_2 for the proposed EPA UTL process. Table 15 shows the results for this revised 168-hour UTL process for the nine units analyzed previously. Appendix C provides plots of the 168 hour rolling averages for remaining 8 units analyzed. Clearly this revised 168-hour UTL process minimizes the number of units with false positives compared to the original process proposed by EPA. In addition, it minimizes the number of allowed false positives.

Increasing the NSR statistics to something greater than presently proposed would result in fewer potential failures for both the EPA proposed process and the alternate 168-hour UTL process. For the alternate 168-hour process, it would likely result in only one of the nine units failing the NSR test without the use of an allowed number of exceedances.

6 Conclusions

The analyses described in the previous sections were performed to evaluate EPA's proposed Upper Tolerance Limit (UTL) method for establishing an EGU's pre-change maximum "achieved" hourly emission rate. Specifically, the analyses were performed to test EPA's hypotheses regarding whether the UTL process adequately captures the variability of EGU emissions and whether the UTL level is properly set so that no "false positives" will result. The analyses considered data from 9 coal-fired EGUs. The following briefly summarizes the conclusions:

6.1 *Evaluation of EPA UTL Process*

- X The UTL process applied to raw EDR data for 9 units showed that 8 had false positives.
- X The UTL process applied to filtered (outliers removed simulating unreported malfunctions) EDR data for 9 units also showed that 8 had false positives.

The conclusion based on these analyses is that the UTL process for the majority of utility units would likely result in false positives.

6.2 *Evaluation of UTL Process Sorted by Pollutant Emission Rate*

- X The UTL pollutant sort process applied to unfiltered raw EDR data for 9 units showed that all would have false positives.
- X The UTL pollutant sort process applied to filtered EDR data for 9 units again showed that all would have false positives.

The conclusion based on these analyses is that, while sorting on the basis of pollutant emission rates improves the process (i.e., shows less overall false positives), all of the units analyzed would have false positives.

6.3 *Evaluation of UTL Process with Equivalent Post-Change Heat Input Sort Dataset*

- X The UTL process applied to unfiltered EDR data for 9 units showed that 5 had false positives.
- X The UTL process applied to filtered EDR data for 9 units showed that 4 had false positives.

The conclusion based on these analyses is that utilizing the same population (highest 10 percent heat input rates) post-change decreases the number of false positives. Nevertheless, many units still would have false positives.

6.4 Evaluation of Adjusting the UTL Independent Variables

- X** Decreasing the Z_{1-p} and Z_{1-q} parameters below those proposed would result in more false positives.
- X** Increasing the Z_{1-p} and Z_{1-q} parameters to 99.98 percent (representative of ~ 2 potential failures per year) would likely result in significantly fewer units having false positives.
- X** Decreasing the heat input sample size N below 10 percent would likely result in significantly fewer units having false positives provided the standard deviation was approximately the same.
- X** The UTL process applied to filtered EDR data for 9 units for the parameter extreme values of $Z_{1-p} = 99.98$, $Z_{1-q} = 99.98$ and $N = 1$ percent for the entire 365 day period shows that 3 units had NO_x false positives and 4 units had SO_2 false positives.
- X** The UTL process applied to filtered EDR data for 9 units for the parameter extreme values of $Z_{1-p} = 99.98$, $Z_{1-q} = 99.98$ and $N = 1$ percent for the same post-change population (i.e., highest 10 percent heat input dataset) shows that 2 units had NO_x false positives and 1 unit had SO_2 false positives.

Based on these analyses, even if the UTL parameters were set at the extremes, many units would still have false positives.

6.5 Evaluation of UTL for 5-Year Long Operating Period

The following analysis shows the results of applying the UTL process to five years of data for the 9 units. The first analysis compared the UTL calculated for each calendar year to that for other calendar years. The second analysis compared the UTL calculated based on the 365-day period with the highest parameter (heat input, NO_x or SO_2 emissions rates) to the hourly emission rate for the five year period. This latter analysis simulates the proposed and alternate UTL processes described in the supplemental proposal.

6.5.1 Comparing 5-Calendar Years UTL Emissions

- X** Comparing 5 calendar years of emission data against the other 4 years using the heat input sort UTL process showed that the highest UTL year for NO_x was not necessarily the highest year for SO_2 for 4 of the 9 units for unfiltered emission datasets.
- X** Comparing 5 calendar years of emission data against the other 4 years using the heat input sort UTL process showed that the maximum emissions in calendar years other than the highest UTL calendar year caused false positives

for 4 of the 9 units for unfiltered emission datasets, i.e., the maximum emissions did not occur in the highest UTL calendar year.

- X The UTL varies significantly from year to year.

6.5.2 Comparing 5 Calendar Years Hourly Emissions Against UTL Emissions

- X Comparing 5 years of emission data using the heat input sort UTL process proposed by EPA resulted in all 9 units having false positives for the unfiltered dataset.
- X Comparing 5 years of emission data using the heat input sort UTL process proposed by EPA resulted in 7 of the 9 units having false positives for the unfiltered dataset.
- X Comparing 5 years of emission data using the alternate NO_x and SO₂ emission-rate sort UTL process proposed by EPA resulted in all 9 units having false positives for the unfiltered dataset.
- X Comparing 5 years of emission data using the alternate NO_x and SO₂ emission-rate sort UTL process proposed by EPA resulted in 8 of the 9 units having false positives for the unfiltered dataset.

6.5.3 168-Hour Revision of the UTL Process

- X Revising the UTL period from 365 days to 168 hours and utilizing the statistics from this 168-hour period improves the UTL process.
- X The revision more closely satisfies EPA's original hypotheses,
- X The number of units showing false positives under the UTL test for NO_x decreased from 6 to 2 in the revised process,
- X The number of units showing false positives under the UTL test for SO₂ decreased from 9 to 3 in the revised process,
- X For units showing false positives under the UTL test, the maximum number of NO_x false positives decreased from 124 to 8 in the revised process,
- X For units showing false positives under the UTL test, the maximum number of SO₂ false positives decreased from 490 to 15 in the revised process.

The general conclusion based on these analyses for CEMS data from 9 coal-fired EGUs is that the hypothesis that EPA used to establish its proposed UTL process was not proven out by applying it to typical EGU CEMS datasets. The datasets utilized avoided the potential complications brought into the process by CEMS data for units that do not operate with the same emission requirements during the entire year (Ozone Season units). Since the analyses were performed for units with high capacity factors, it also did not address the complications arising from cyclic operation of EGUs with relatively small capacity factors. As a consequence, the analyses performed herein are felt to be the best that could be expected. Therefore, under the best conditions, EPA's proposed UTL process does not support the EPA hypotheses.

There were two analyses discussed in this paper that resulted in a reasonably small number of positives: (1) the proposed UTL process, revised to use a one-percent sorting criterion and a confidence interval of 99.98; and (2) the 168-hour UTL process. These analyses minimized the number of false positives, but they did not eliminate them. Therefore, additional steps should be used to provide internal consistency and account for the remaining false positives. For example, the following two steps can be added:

- X** Test the pre-change hourly emissions for false positives, and
- X** In determining whether there has been a significant increase in emissions after a change, allow as a safe harbor the number of hourly false positives that occurred during the pre-change period.

7 References

1. Mary Gibbons Natrella, "Experimental Statistics," NBS Handbook 91, U.S. Department of Commerce, 1963.
2. Standards of Performance for Electric Utility Steam Generating Units for which construction commenced after September 18, 1978 40 CFR 60, Subpart Da, promulgated June 11, 1979.
3. Proposed New Source Performance Standards for Industrial-Commercial – Institutional Generating Units, 40 CFR, Subpart Db, proposed June 19, 1986.
4. Statistical Analysis of Wet Flue Gas Desulfurization Systems and Coal Sulfur Content, Volume 1: Statistical Analysis, Radian Corporation, August 18, 1983 EPA Report No. 68-20-3816.
5. Fed. Reg. Vol. 40, No. 194 – Monday, October 6, 1975, 60.45.

TABLE 1 Electric Utility Units Selected for UTL Analysis

Plant	Unit	Unit Size, MW	Boiler Type	NOx Control	SO2 Control	Fuel
E	1	780	Tangential	Combustion	Venturi	Sub-Bituminous
A	2	775			Spray	Bituminous
C	3	510			Spray	Bituminous
B	5	770	Dry Bottom Wall	Combustion	Spray	Bituminous
F	1	700			Spray	Bituminous
G	1	790			Spray	Bituminous
D	4	800			Spray	Sub-Bituminous
H	1	635	Dry Bottom Wall	SCR	Spray	Bituminous
I	8	650	Tangential	SCR	Venturi	Sub-Bituminous

TABLE 2 Results for EPA UTL Method For 2006

Plant	Unit	N	NOx			SO2		
			UTL NSR NOx Before	Max NOx - All Data After	Number False Positive Hrs	UTL NSR SO ₂ Before	Max SO ₂ - All Data After	Number False Positive Hrs
E	1	795	4361	4829	11	1,096	2,117	49
A	2	775	2985	2854	0	9,766	10,257	2
C	3	506	544	561	1	2,538	2,561	1
B	5	769	4848	4686	0	9,443	9,328	0
F	1	759	4337	4319	0	6,092	6,170	1
G	1	788	3886	4614	33	5,388	6,705	1
D	4	793	2525	2603	4	2,332	3,595	687
H	1	783	1309	2801	129	1,825	15,366	400
I	8	857	311	603	36	1,325	1,551	123

TABLE 3 Results for EPA UTL Method for 2006
Potential Outliers Removed

Plant	Unit	NO _x			SO ₂		
		UTL NSR NO _x Before	Max NO _x - All Data After	Number False Positive Hrs	UTL NSR SO ₂ Before	Max SO ₂ - All Data After	Number False Positive Hrs
E	1	4361	4829	11	1023	1061	19
A	2	2985	2854	0	9766	10257	2
C	3	544	561	1	2538	2561	1
B	5	4848	4686	0	9443	9328	0
F	1	4337	4319	0	6092	6170	1
G	1	3810	4254	10	5350	4214	0
D	4	2525	2603	4	2333	3055	682
H	1	785	1123	134	1829	4084	317
I	8	311	331	7	1325	1431	98

TABLE 4 UTL Results for NO_x and SO₂ Rate Sorted Datasets for 2006
Rate Sorted Datasets for 2006
Unfiltered Dataset

Plant	Unit	NO _x			SO ₂		
		UTL NSR NO _x Before	Max NO _x - All Data After	Number False Positive Hrs	UTL NSR SO ₂ Before	Max SO ₂ - All Data After	Number False Positive Hrs
E	1	4,272	4,829	15	1,356	2,117	17
A	2	2,862	2,854	0	9,311	10,257	10
C	3	539	561	1	2,512	2,561	2
B	5	4,421	4,686	5	8,720	9,328	11
F	1	4,137	4,319	5	5,210	6,170	9
G	1	4,123	4,614	28	4,439	6,705	4
D	4	2,479	2,603	8	3,108	3,595	4
H	1	2,357	2,801	5	11,969	15,366	42
I	8	412	603	23	1,504	1,551	5

TABLE 5 UTL Results for NO_x and SO₂ Rate Sorted Datasets for 2006
Outliers Removed

Plant	Unit	NO _x			SO ₂		
		UTL NSR NO _x Before	Max NO _x - All Data After	Number False Positive Hrs	UTL NSR SO ₂ Before	Max SO ₂ - All Data After	Number False Positive Hrs
E	1	4,272	4,829	15	1,064	1,061	0
A	2	2,862	2,854	0	9,311	10,257	10
C	3	539	561	1	2,512	2,561	2
B	5	4,421	4,686	5	8,720	9,328	11
F	1	4,137	4,319	5	5,210	6,170	9
G	1	3,772	4,254	11	4,275	4,214	0
D	4	2,479	2,603	8	3,073	3,055	0
H	1	1,143	1,123	0	3,508	4,084	10
I	8	303	331	18	1,461	1,431	0

TABLE 6 Comparison of UTL False Positive Hours for Various Alterations to Datasets
Year 2006

Plant	Unit	NO _x				SO ₂			
		EPA UTL Method - Unfiltered	EPA Method - Filtered	EPA Method - Unfiltered using 10% Highest HI Data After	EPA Method - Filtered using 10% Highest HI Data After	EPA UTL Method - Unfiltered	EPA Method - Filtered	EPA Method - Unfiltered using 10% Highest HI Data After	EPA Method - Filtered using 10% Highest HI Data After
1	2	3	4	5	6	7	8	9	10
E	1	11	11	8	8	47	16	8	2
A	2	0	0	0	0	2	2	0	0
C	3	1	1	0	0	1	1	0	0
B	5	0	0	0	0	0	0	0	0
F	1	0	0	0	0	1	1	0	0
G	1	33	10	4	0	1	0	0	0
D	4	4	4	4	4	662	658	17	17
H	1	129	134	17	3	331	327	8	7
I	8	36	7	2	2	125	99	11	11

FIGURE 1 Impact of Confidence Limits on Standard Deviation Multiplier

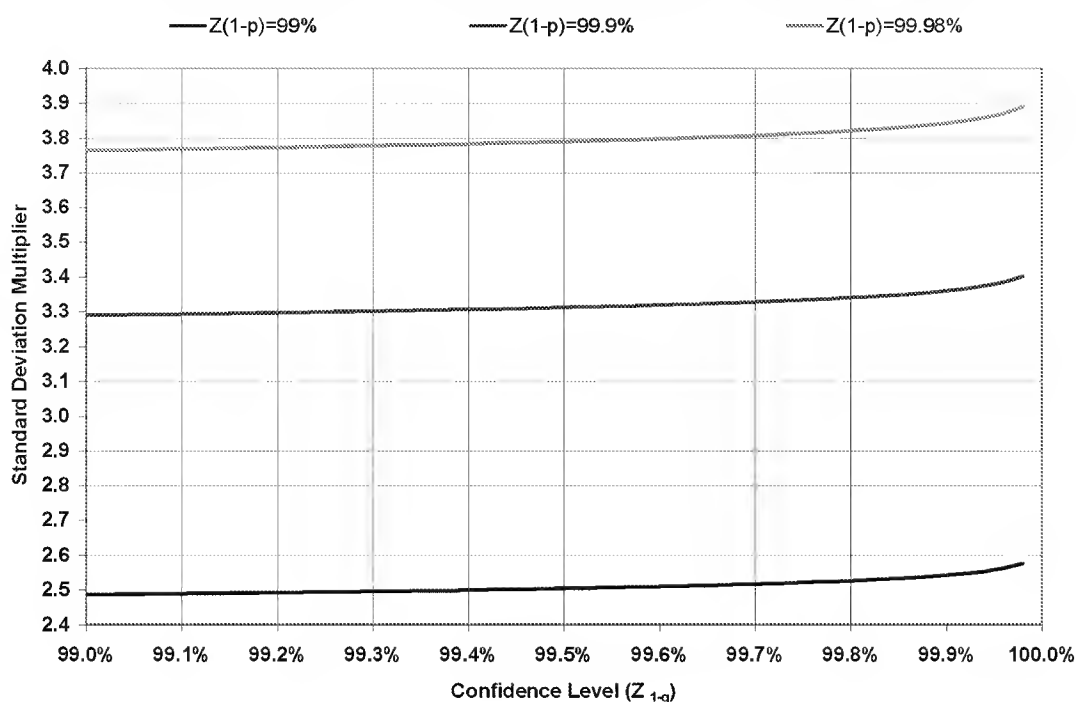


Figure 2 Impact of Fraction of 365 Day Period on Standard Deviation Multiplier

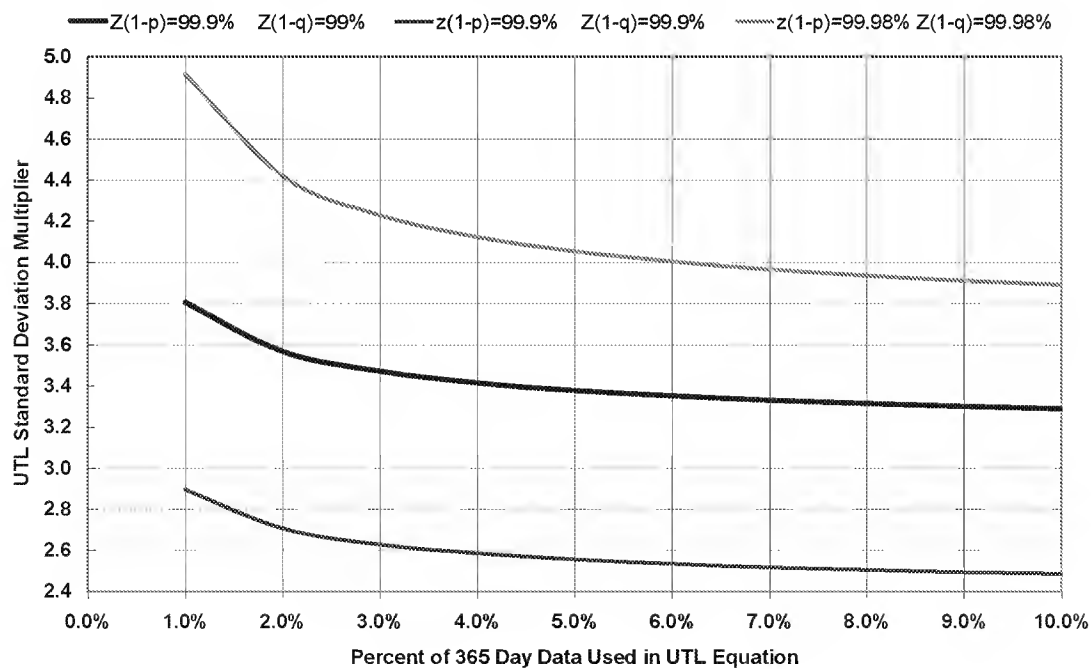


TABLE 7 Comparison of UTL False Positive Hours for One Percent of Dataset
 Year 2006 Sorted on Highest Heat Input for Filtered Data
Z1-p and Z1-q = 99.98 for 1 Percent of Data

Plant	Unit	NO _x		SO ₂	
		EPA Method - All Data After Change	EPA Method - 1 % Of Data After Change	EPA Method - All Data After Change	EPA Method - 1 % Of Data After Change
E	1	0	0	16	0
A	2	0	0	0	0
C	3	0	0	0	0
B	5	0	0	0	0
F	1	0	0	0	0
G	1	25	0	1	0
D	4	0	0	21	0
H	1	5	2	135	1
I	8	27	0	0	0

**Table 8 Five Year Comparison of UTL Results for Heat Input Sorting
Years 2002 Through 2006**

Plant and Unit	Operating Year	NOx					SO2				
		UTL NSR NOx Before	All Data After		10 % Data After		UTL NSR SO2 Before	All Data After		10 % Data After	
			Max NOx - All Data After	Number Hours Exceeding	Max NOx - 10% Data After	Number False Positive Hrs		Max SO2 - All Data After	Number Hours Exceeding	Max SO2 - 10% Data After	Number False Positive Hrs
E1	2002	4334	4485	5	4485	5	1045	1020		1020	
	2003	3817	3943	10	3943	10	1005	1015	6	1015	6
	2004	4096	4354	10	4354	10	1097	1084		1084	
	2005	4068	4138	6	4138	6	1014	1007		1007	
	2006	4272	4829	15	4829	15	1064	1061		1061	
A2	2002	3162	3230	2	3230	2	9725	10123	4	10123	4
	2003	2996	3063	1	3063	1	9737	9916	5	9916	5
	2004	2655	2760	6	2760	6	9639	10717	19	10717	19
	2005	2776	2776	1	2776	1	9177	9466	9	9466	9
	2006	2862	2854		2854		9311	10257	10	10257	10
C3	2002	627	653	7	653	7	2728	2661		2661	
	2003	699	787	9	787	9	3178	3114		3114	
	2004	640	671	9	671	9	2624	2605		2605	
	2005	552	571	2	571	2	2739	2710		2710	
	2006	539	561	1	561	1	2512	2561	2	2561	2
B5	2002	4393	4762	9	4762	9	8296	8618	8	8618	8
	2003	4302	4337	4	4337	4	8130	8355	15	8355	15
	2004	4091	4460	8	4460	8	7998	8013	1	8013	1
	2005	4842	5084	4	5084	4	9532	10082	4	10082	4
	2006	4421	4686	5	4686	5	8720	9328	11	9328	11
F1	2002	4590	4907	6	4907	6	6607	6485		6485	
	2003	4047	4376	10	4376	10	6489	6484		6484	
	2004	4144	4325	4	4325	4	5126	5375	11	5375	11
	2005	4305	4424	4	4424	4	5521	5750	7	5750	7
	2006	4137	4319	5	4319	5	5210	6170	9	6170	9
G1	2002	5193	4905		4905		3796	3878	7	3878	7
	2003	5324	5196		5196		3803	3922	4	3922	4
	2004	4507	4538	1	4538	1	3902	4077	11	4077	11
	2005	4055	4139	2	4139	2	4527	4679	5	4679	5
	2006	3772	4254	11	4254	11	4275	4214		4214	
D4	2002	2951	3070	6	3070	6	2534	2449		2449	
	2003	2908	3080	7	3080	7	2700	2820	2	2820	2
	2004	2370	2471	16	2471	16	2185	2219	3	2219	3
	2005	2340	2384	8	2384	8	2296	2327	4	2327	4
	2006	2479	2603	8	2603	8	2085	2825	18	2301	13
H1	2002	2860	2786		2786		2042	1978		1978	
	2003	5692	4633		4633		2990	2903		2903	
	2004	4132	3388		3388		3982	4146	3	4146	3
	2005	1715	1402		1402		3425	4177	21	4177	21
	2006	1143	1123		1123		3508	4084	13	4084	13
I8	2004	537	586	15	586	15	1485	1413		1413	
	2005	314	353	12	353	12	1366	1337		1337	
	2006	303	331	18	331	18	1461	1431		1431	

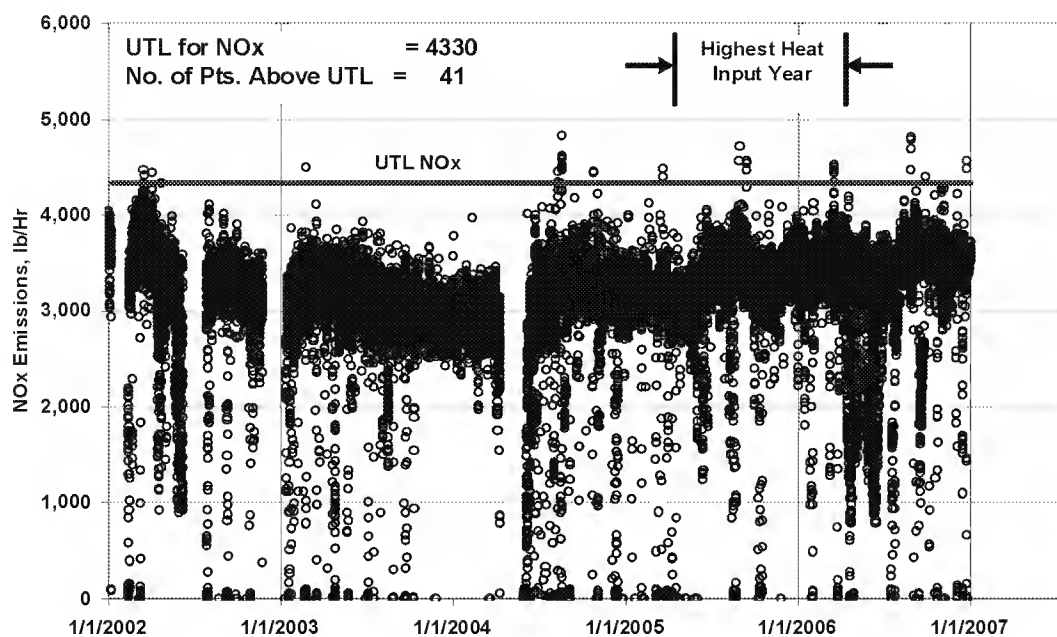
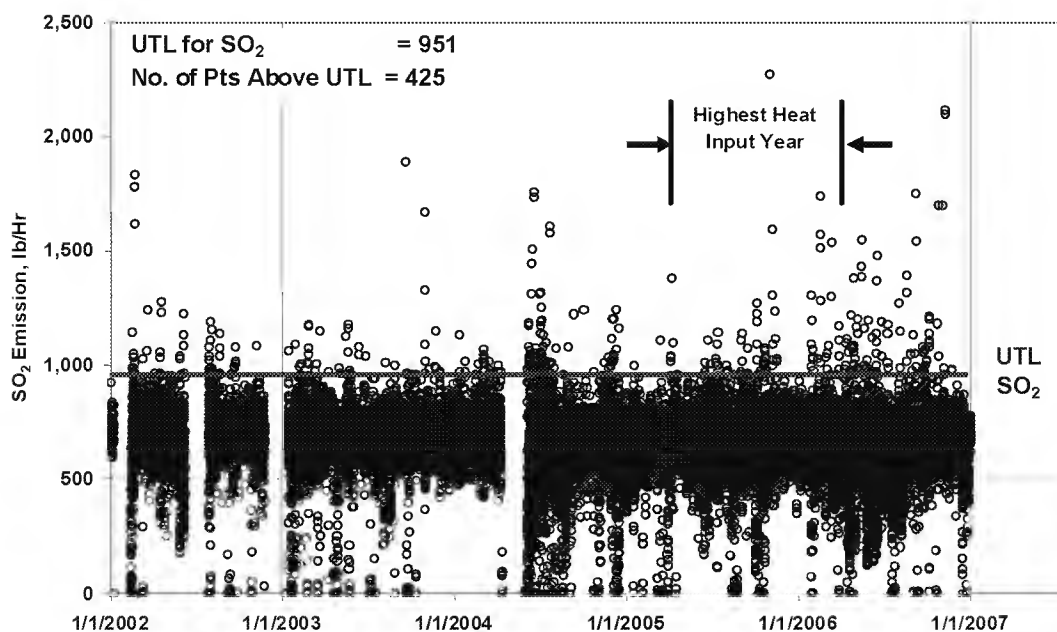
Figure 3 Unit E1 Five Year Hourly NO_x AveragesUTL for NO_x Calculated for Highest 365 Day Heat Input**Figure 4 Unit E1 Five Year Hourly SO₂ Averages**UTL for SO₂ Calculated for Highest 365 Day Heat Input

TABLE 9 Results for EPA Heat Input Sorting UTL Method for 5 Years
Comparing All Hourly Emissions Post-Change Unfiltered

Plant	Unit	NOx				SO2			
		Mean NOx	UTL NSR NOx Before	Max NOx - All Data After	Number False Positive Hrs	Mean SO ₂	UTL NSR SO ₂ Before	Max SO ₂ - All Data After	Number False Positive Hrs
E	1	3537	4330	4838	41	665	951	3,616	425
A	2	2586	3111	5749	47	8,216	10,132	10,717	12
C	3	541	653	787	35	2,178	3,073	3,114	12
B	5	4195	5449	5084	0	8,124	10,723	11,841	2
F	1	3400	4181	4907	124	4,361	6,260	7,154	21
G	1	3352	5103	7712	41	2,773	4,204	7,719	61
D	4	2652	3061	3080	3	1,652	2,919	7,630	77
H	1	1697	6083	5819	0	1,289	2,922	21,546	490

TABLE 10 Results for EPA Heat Input Sorting UTL Method for 5 Years
Comparing All Hourly Emissions Post-Change - Outliers Removed

Plant	Unit	NOx			SO2		
		UTL NSR NOx Before	Max NOx After	Number False Positive Hrs	UTL NSR SO ₂ Before	Max SO ₂ After	Number False Positive Hrs
E	1	4282	4542	32	946	1,048	277
A	2	3111	3230	10	10,132	10,717	12
C	3	653	715	31	3,073	3,114	12
B	5	5449	5084	0	10,685	10,082	0
F	1	4181	4658	120	6,260	6,380	10
G	1	5063	4835	0	4,194	4,370	32
D	4	3061	2948	0	2,873	2,630	0
H	1	5136	3473	0	2,748	3,754	298

TABLE 11 Results for EPA NO_x/SO₂ Rate Sorting UTL Method for 5 Years
Comparing All Hourly Emissions Post-Change - Unfiltered

Plant	Unit	NO _x				SO ₂			
		Mean NO _x	UTL NSR NO _x Before	Max NO _x After	Number False Positive Hrs	Mean SO ₂	UTL NSR SO ₂ Before	Max SO ₂ After	Number False Positive Hrs
E	1	3784	4219	4838	64	839	1,250	3,616	46
A	2	2777	3162	3162	2	8,925	9,684	10,717	33
C	3	562	669	787	26	2,394	2,888	3,114	51
B	5	4575	4841	5084	4	8,780	9,611	11,841	6
F	1	3660	4127	4907	172	4,902	5,542	7,154	295
G	1	4030	4831	7712	125	3,437	4,068	7,719	102
D	4	2697	2950	3080	10	1,954	2,595	7,630	364
H	1	2640	3512	5819	811	2,867	9,969	21,546	101

TABLE 12 Results for EPA NO_x/SO₂ Rate Sorting UTL Method for 5 Years
Comparing All Hourly Emissions Post-Change - Outliers Removed

Plant	Unit	NO _x				SO ₂			
		Mean NO _x	UTL NSR NO _x Before	Max NO _x After	Number False Positive Hrs	Mean SO ₂	UTL NSR SO ₂ Before	Max SO ₂ After	Number False Positive Hrs
E	1	3531	4282	4542	32	712	950	1,048	260
A	2	2587	3115	3162	0	8,216	10,132	10,717	12
C	3	541	653	715	31	2,178	3,073	3,114	12
B	5	4195	5449	5084	0	8,120	10,685	10,082	0
F	1	3451	4302	4658	50	4,518	5,980	6,380	83
G	1	3369	5014	4835	0	3,013	3,934	4,370	149
D	4	2652	3061	2948	0	1,571	2,379	2,630	546
H	1	2408	3083	3473	232	1,285	3,078	3,754	145

TABLE 13 Results for EPA NO_x/SO₂ Rate Sorting UTL Method for 5 Years
 Comparing All Hourly Emissions Post-Change - Unfiltered 1% Population @ 99.98 CI

Plant	Unit	NO _x				SO ₂			
		Mean NO _x	UTL NSR NO _x Before	Max NO _x After	Number False Positive Hrs	Mean SO ₂	UTL NSR SO ₂ Before	Max SO ₂ After	Number False Positive Hrs
E	1	4072	5030	4838	0	1,040	2,627	3,616	2
A	2	3020	3332	5749	37	9,423	10,239	10,717	10
C	3	637	754	787	3	2,753	3,353	3,114	0
B	5	4745	5065	5084	1	9,282	11,450	11,841	2
F	1	3980	4478	4907	17	5,331	6,215	7,154	26
G	1	4573	5304	7712	24	3,837	5,356	7,719	9
D	4	2866	3110	3080	0	2,349	4,370	7,630	38
H	1	3270	4725	5819	89	8,068	27,684	21,546	0

TABLE 14 Results for EPA NO_x/SO₂ Rate Sorting UTL Method for 5 Years
 Comparing All Hourly Emissions Post-Change - Filtered 1% Population @ 99.98 CI

Plant	Unit	NO _x				SO ₂			
		Mean NO _x	UTL NSR NO _x Before	Max NO _x After	Number False Positive Hrs	Mean SO ₂	UTL NSR SO ₂ Before	Max SO ₂ After	Number False Positive Hrs
E	1	3998	4418	4542	22	940	1,076	1,048	0
A	2	3020	3332	3230	0	9,423	10,239	10,717	10
C	3	637	754	715	0	2,753	3,353	3,114	0
B	5	4745	5065	5084	1	9,249	10,898	10,082	0
F	1	3980	4478	4658	13	5,331	6,215	6,380	15
G	1	4503	5064	4835	0	3,774	4,284	4,370	10
D	4	2866	3110	2948	0	2,194	2,566	2,626	25
H	1	3082	3573	3473	0	3,271	4,874	3,754	0

Table 15 Comparison of Proposed UTL and Revised UTL Methods
EPA Proposed Statistics (99.9 and 90.0)

Plant	Unit	NO _x False Positives		SO ₂ False Positives	
		EPA Method	168 Hr Method	EPA Method	168 Hr Method
E	3	35	0	12	0
A	3	41	0	425	15
C	2	47	0	12	0
B	5	0	0	2	0
F	1	44	0	145	0
G	4	3	0	77	2
D	1	124	0	21	0
H	1	41	1	490	3
I	8	87	8	315	0

Figure 5 Unit E1 168 Hour NO_x UTL Results

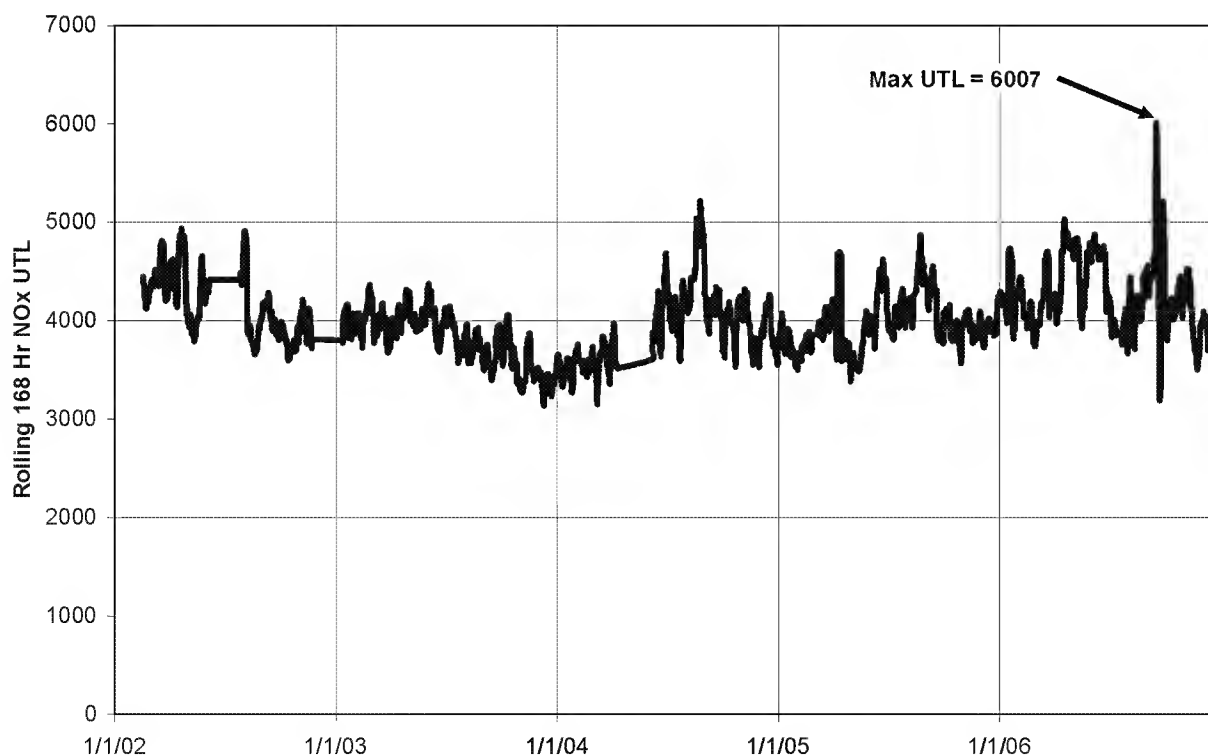
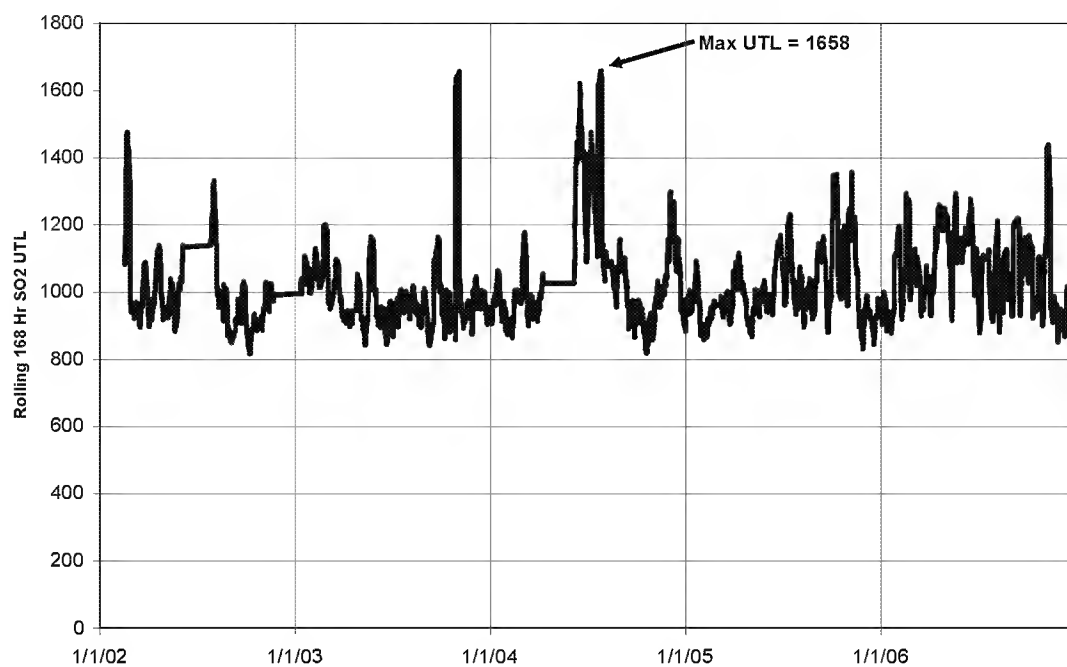


Figure 6 Unit E1 168 Hour SO₂ UTL Results

APPENDIX A

Normality Tests

Unit C3 NOx Normality Test

Moments			
N	495	Sum Weights	495
Mean	217.332576	Sum Observations	107579.625
Std Deviation	52.0433222	Variance	2708.50738
Skewness	0.1105995	Kurtosis	0.69811394
Uncorrected SS	24718559.8	Corrected SS	1338002.65
Coeff Variation	23.9463973	Std Error Mean	2.33917338

Tests for Normality					
Test		Statistic		p Value	
Shapiro-Wilk	W	0.965804	Pr < W	<0.0001	
Kolmogorov-Smirnov	D	0.101974	Pr > D	<0.0100	
Cramer-von Mises	W-Sq	1.174798	Pr > W-Sq	<0.0050	
Anderson-Darling	A-Sq	6.637608	Pr > A-Sq	<0.0050	

Unit C3 SO₂ Normality Test

Moments			
N	495	Sum Weights	495
Mean	779.235152	Sum Observations	385721.4
Std Deviation	161.04918	Variance	25936.8385
Skewness	-1.5592683	Kurtosis	5.39238441
Uncorrected SS	313380472	Corrected SS	12812798.2
Coeff Variation	20.667597	Std Error Mean	7.23862235

Tests for Normality					
Test	Statistic		p Value		
Shapiro-Wilk	W	0.87108	Pr < W	<0.0001	
Kolmogorov-Smirnov	D	0.132511	Pr > D	<0.0100	
Cramer-von Mises	W-Sq	2.219216	Pr > W-Sq	<0.0050	
Anderson-Darling	A-Sq	14.14721	Pr > A-Sq	<0.0050	

Unit E1 NO_x Normality Test

Moments			
N	809	Sum Weights	809
Mean	1774.19197	Sum Observations	1435321.3
Std Deviation	484.345308	Variance	234590.378
Skewness	0.54147479	Kurtosis	0.60875723
Uncorrected SS	2736084555	Corrected SS	189549025
Coeff Variation	27.2994871	Std Error Mean	17.0286742

Tests for Normality				
Test	Statistic		p Value	
Shapiro-Wilk	W	0.978899	Pr < W	<0.0001
Kolmogorov-Smirnov	D	0.088927	Pr > D	<0.0100
Cramer-von Mises	W-Sq	1.009841	Pr > W-Sq	<0.0050
Anderson-Darling	A-Sq	4.954598	Pr > A-Sq	<0.0050

Unit E1 SO₂ Normality Test

Moments			
N	795	Sum Weights	795
Mean	471.098365	Sum Observations	374523.2
Std Deviation	209.983818	Variance	44093.2038
Skewness	0.56555629	Kurtosis	0.498716
Uncorrected SS	211447271	Corrected SS	35010003.8
Coeff Variation	44.5732428	Std Error Mean	7.44735856

Tests for Normality					
Test	Statistic		p Value		
Shapiro-Wilk	W	0.974141	Pr < W	<0.0001	
Kolmogorov-Smirnov	D	0.0669	Pr > D	<0.0100	
Cramer-von Mises	W-Sq	0.639596	Pr > W-Sq	<0.0050	
Anderson-Darling	A-Sq	4.210138	Pr > A-Sq	<0.0050	

Unit H1 NOx Normality Test

Moments			
N	783	Sum Weights	783
Mean	440.915014	Sum Observations	345236.456
Std Deviation	271.622058	Variance	73778.5421
Skewness	1.89939919	Kurtosis	3.42654247
Uncorrected SS	209914757	Corrected SS	57694819.9
Coeff Variation	61.6041751	Std Error Mean	9.70698042

Tests for Normality					
Test	Statistic		p Value		
Shapiro-Wilk	W	0.76175	Pr < W	<0.0001	
Kolmogorov-Smirnov	D	0.305423	Pr > D	<0.0100	
Cramer-von Mises	W-Sq	14.20566	Pr > W-Sq	<0.0050	
Anderson-Darling	A-Sq	70.99845	Pr > A-Sq	<0.0050	

Unit H1 SO₂ Normality Test

Moments			
N	783	Sum Weights	783
Mean	688.703959	Sum Observations	539255.2
Std Deviation	1262.26472	Variance	1593312.22
Skewness	4.69787168	Kurtosis	25.646491
Uncorrected SS	1617357344	Corrected SS	1245970153
Coeff Variation	183.281176	Std Error Mean	45.1096609

Tests for Normality					
Test	Statistic		p Value		
Shapiro-Wilk	W	0.437925	Pr < W	<0.0001	
Kolmogorov-Smirnov	D	0.31442	Pr > D	<0.0100	
Cramer-von Mises	W-Sq	28.77426	Pr > W-Sq	<0.0050	
Anderson-Darling	A-Sq	144.3258	Pr > A-Sq	<0.0050	

Unit A2 NO_x Normality Test

Moments			
N	775	Sum Weights	775
Mean	812.832318	Sum Observations	629945.047
Std Deviation	135.638381	Variance	18397.7703
Skewness	-0.3076543	Kurtosis	1.13710541
Uncorrected SS	526279567	Corrected SS	14239874.2
Coeff Variation	16.6871294	Std Error Mean	4.87227446

Tests for Normality					
Test		Statistic		p Value	
Shapiro-Wilk	W	0.976013	Pr < W	<0.0001	
Kolmogorov-Smirnov	D	0.065263	Pr > D	<0.0100	
Cramer-von Mises	W-Sq	0.877073	Pr > W-Sq	<0.0050	
Anderson-Darling	A-Sq	4.820102	Pr > A-Sq	<0.0050	

Unit A2 SO₂ Normality Test

Moments			
N	775	Sum Weights	775
Mean	2365.60645	Sum Observations	1833345
Std Deviation	258.372181	Variance	66756.1841
Skewness	-0.7004401	Kurtosis	2.61806914
Uncorrected SS	4388642047	Corrected SS	51669286.5
Coeff Variation	10.9220273	Std Error Mean	9.28100273

Tests for Normality				
Test	Statistic		p Value	
Shapiro-Wilk	W	0.962366	Pr < W	<0.0001
Kolmogorov-Smirnov	D	0.057033	Pr > D	<0.0100
Cramer-von Mises	W-Sq	0.50806	Pr > W-Sq	<0.0050
Anderson-Darling	A-Sq	3.890565	Pr > A-Sq	<0.0050

Unit B5 NOx Normality Test

Moments			
N	769	Sum Weights	769
Mean	1328.13423	Sum Observations	1021335.22
Std Deviation	321.663135	Variance	103467.172
Skewness	-0.5181826	Kurtosis	-0.3121306
Uncorrected SS	1435933052	Corrected SS	79462788.4
Coeff Variation	24.2191737	Std Error Mean	11.5994693

Tests for Normality					
Test		Statistic	p Value		
Shapiro-Wilk	W	0.964562	Pr < W	<0.0001	
Kolmogorov-Smirnov	D	0.065287	Pr > D	<0.0100	
Cramer-von Mises	W-Sq	1.076395	Pr > W-Sq	<0.0050	
Anderson-Darling	A-Sq	8.014388	Pr > A-Sq	<0.0050	

Unit B5 SO₂ Normality Test

Moments			
N	769	Sum Weights	769
Mean	3462.85748	Sum Observations	2662937.4
Std Deviation	576.735806	Variance	332624.19
Skewness	-0.4337334	Kurtosis	-0.5043948
Uncorrected SS	9476828065	Corrected SS	255455378
Coeff Variation	16.6549103	Std Error Mean	20.7976251

Tests for Normality					
Test	Statistic		p Value		
Shapiro-Wilk	W	0.974875	Pr < W	<0.0001	
Kolmogorov-Smirnov	D	0.057843	Pr > D	<0.0100	
Cramer-von Mises	W-Sq	0.810927	Pr > W-Sq	<0.0050	
Anderson-Darling	A-Sq	5.411698	Pr > A-Sq	<0.0050	

Unit I8 NOx Normality Test

Moments			
N	857	Sum Weights	857
Mean	196.123721	Sum Observations	168078.029
Std Deviation	52.0784426	Variance	2712.16418
Skewness	1.47640305	Kurtosis	10.9861023
Uncorrected SS	35285701.1	Corrected SS	2321612.54
Coeff Variation	26.5538723	Std Error Mean	1.77896571

Tests for Normality					
Test	Statistic		p Value		
Shapiro-Wilk	W	0.861744	Pr < W	<0.0001	
Kolmogorov-Smirnov	D	0.107319	Pr > D	<0.0100	
Cramer-von Mises	W-Sq	2.631251	Pr > W-Sq	<0.0050	
Anderson-Darling	A-Sq	17.32757	Pr > A-Sq	<0.0050	

Unit I8 SO₂ Normality Test

Moments			
N	857	Sum Weights	857
Mean	722.87853	Sum Observations	619506.9
Std Deviation	205.502307	Variance	42231.1983
Skewness	-0.1698377	Kurtosis	-0.5152756
Uncorrected SS	483978143	Corrected SS	36149905.7
Coeff Variation	28.4283318	Std Error Mean	7.01982509

Tests for Normality					
Test		Statistic		p Value	
Shapiro-Wilk	W	0.982579	Pr < W	<0.0001	
Kolmogorov-Smirnov	D	0.065399	Pr > D	<0.0100	
Cramer-von Mises	W-Sq	1.122564	Pr > W-Sq	<0.0050	
Anderson-Darling	A-Sq	6.182175	Pr > A-Sq	<0.0050	

Unit D4 NOx Normality Test

Moments			
N	801	Sum Weights	801
Mean	1566.91496	Sum Observations	1255098.88
Std Deviation	313.687393	Variance	98399.7804
Skewness	-2.1447492	Kurtosis	4.9275006
Uncorrected SS	2045353040	Corrected SS	78719824.3
Coeff Variation	20.0194268	Std Error Mean	11.083599

Tests for Normality				
Test		Statistic	p Value	
Shapiro-Wilk	W	0.765549	Pr < W	<0.0001
Kolmogorov-Smirnov	D	0.183144	Pr > D	<0.0100
Cramer-von Mises	W-Sq	9.566471	Pr > W-Sq	<0.0050
Anderson-Darling	A-Sq	54.96793	Pr > A-Sq	<0.0050

Unit D4 SO₂ Normality Test

Moments			
N	793	Sum Weights	793
Mean	1851.8454	Sum Observations	1468513.4
Std Deviation	733.619565	Variance	538197.666
Skewness	-0.3349436	Kurtosis	-1.3199864
Uncorrected SS	3145712332	Corrected SS	426252551
Coeff Variation	39.6155946	Std Error Mean	26.0515946

Tests for Normality				
Test	Statistic		p Value	
Shapiro-Wilk	W	0.903737	Pr < W	<0.0001
Kolmogorov-Smirnov	D	0.167885	Pr > D	<0.0100
Cramer-von Mises	W-Sq	5.183818	Pr > W-Sq	<0.0050
Anderson-Darling	A-Sq	29.88853	Pr > A-Sq	<0.0050

Unit F1 NOx Normality Test

Moments			
N	760	Sum Weights	760
Mean	1783.1991	Sum Observations	1355231.32
Std Deviation	503.229313	Variance	253239.741
Skewness	-0.6522447	Kurtosis	-0.0351421
Uncorrected SS	2608856226	Corrected SS	192208964
Coeff Variation	28.2205903	Std Error Mean	18.2540457

Tests for Normality					
Test		Statistic		p Value	
Shapiro-Wilk	W	0.96053	Pr < W	<0.0001	
Kolmogorov-Smirnov	D	0.061201	Pr > D	<0.0100	
Cramer-von Mises	W-Sq	0.906918	Pr > W-Sq	<0.0050	
Anderson-Darling	A-Sq	7.163965	Pr > A-Sq	<0.0050	

Unit F1 SO₂ Normality Test

Moments			
N	758	Sum Weights	758
Mean	2039.48496	Sum Observations	1545929.6
Std Deviation	819.166081	Variance	671033.068
Skewness	-0.3110148	Kurtosis	-0.6091456
Uncorrected SS	3660872201	Corrected SS	507972032
Coeff Variation	40.1653406	Std Error Mean	29.7534519

Tests for Normality					
Test		Statistic	p Value		
Shapiro-Wilk	W	0.977796	Pr < W	<0.0001	
Kolmogorov-Smirnov	D	0.047927	Pr > D	<0.0100	
Cramer-von Mises	W-Sq	0.521363	Pr > W-Sq	<0.0050	
Anderson-Darling	A-Sq	4.103342	Pr > A-Sq	<0.0050	

Unit G1 NOx Normality Test

Moments			
N	786	Sum Weights	786
Mean	1355.80702	Sum Observations	1065664.32
Std Deviation	396.797275	Variance	157448.078
Skewness	0.08074266	Kurtosis	0.92305045
Uncorrected SS	1568431911	Corrected SS	123596741
Coeff Variation	29.2665009	Std Error Mean	14.1532901

Tests for Normality				
Test	Statistic		p Value	
Shapiro-Wilk	W	0.985978	Pr < W	<0.0001
Kolmogorov-Smirnov	D	0.037563	Pr > D	<0.0100
Cramer-von Mises	W-Sq	0.207288	Pr > W-Sq	<0.0050
Anderson-Darling	A-Sq	1.668778	Pr > A-Sq	<0.0050

Unit G1 SO₂ Normality Test

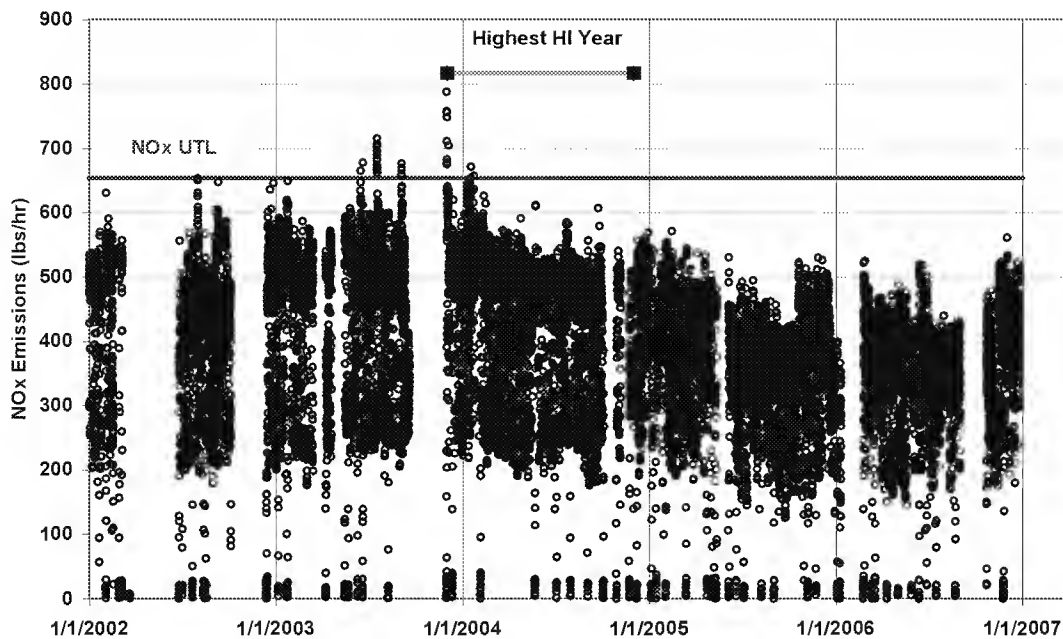
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N	782	Sum Weights	782
Mean	1440.34399	Sum Observations	1126349
Std Deviation	538.588917	Variance	290078.021
Skewness	0.39690362	Kurtosis	0.04711258
Uncorrected SS	1848880947	Corrected SS	226550935
Coeff Variation	37.3930756	Std Error Mean	19.2599003

Tests for Normality				
Test		Statistic	p Value	
Shapiro-Wilk	W	0.984928	Pr < W	<0.0001
Kolmogorov-Smirnov	D	0.050488	Pr > D	<0.0100
Cramer-von Mises	W-Sq	0.416161	Pr > W-Sq	<0.0050
Anderson-Darling	A-Sq	2.60673	Pr > A-Sq	<0.0050

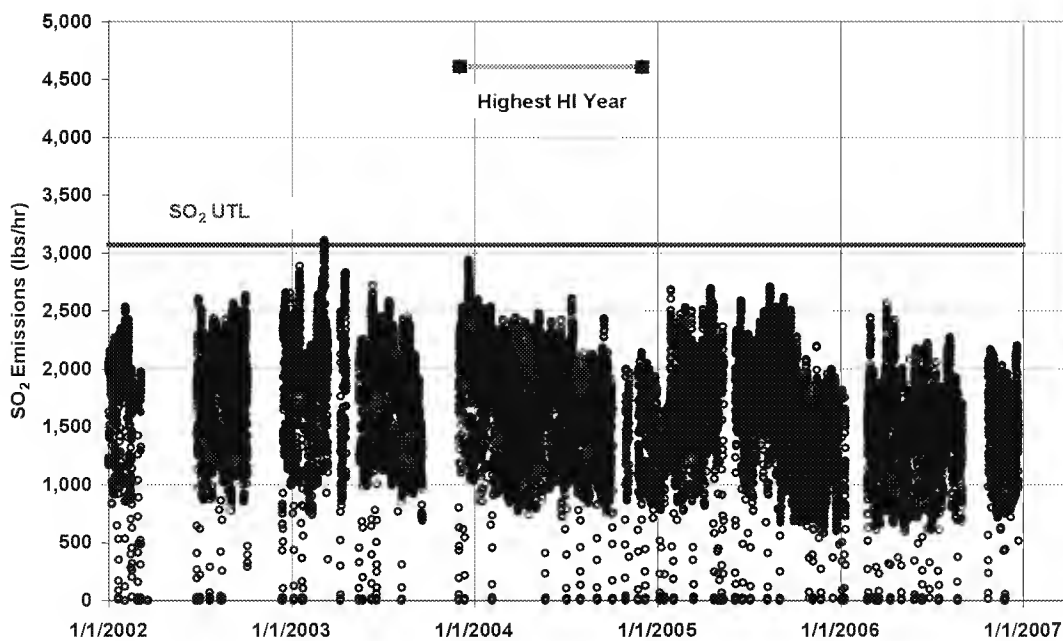
APPENDIX B

Five Year EPA UTL Analysis Data Plots

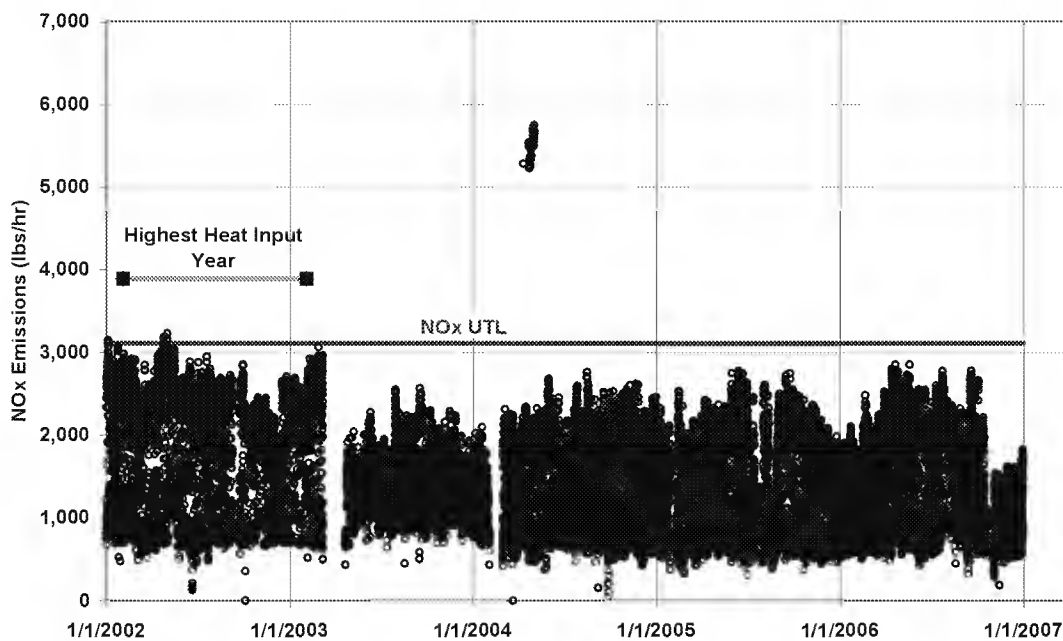
Unit C Hourly NO_x 2002 to 2006
Unfiltered Data



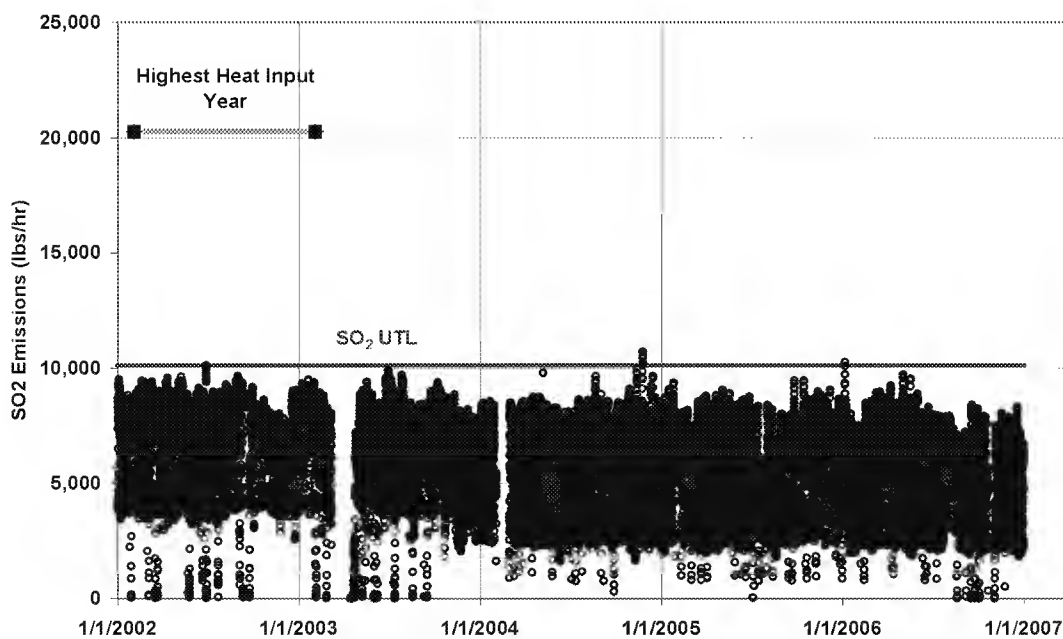
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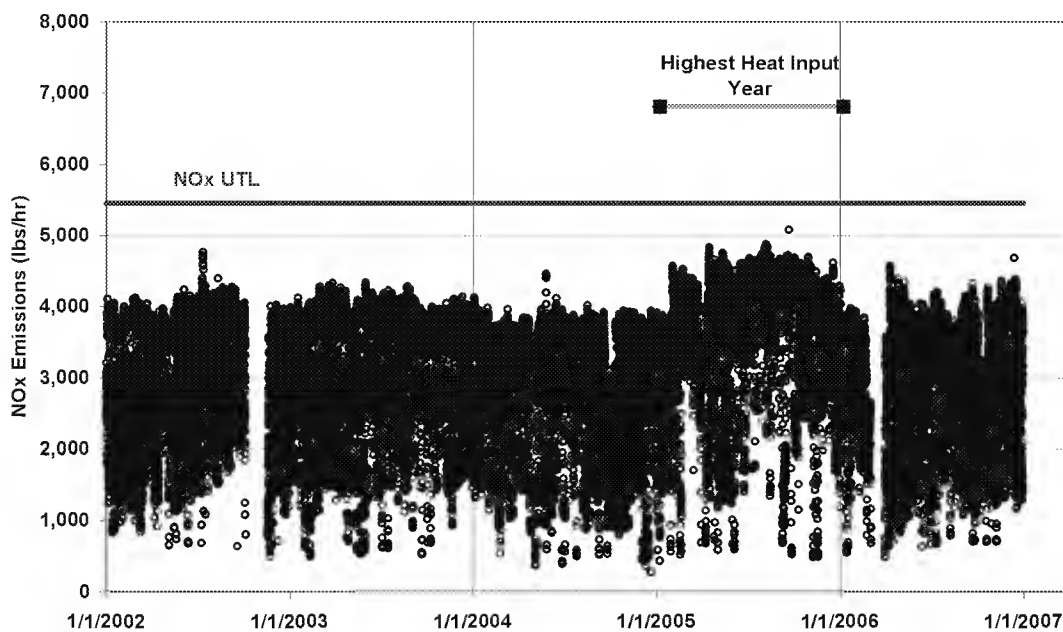
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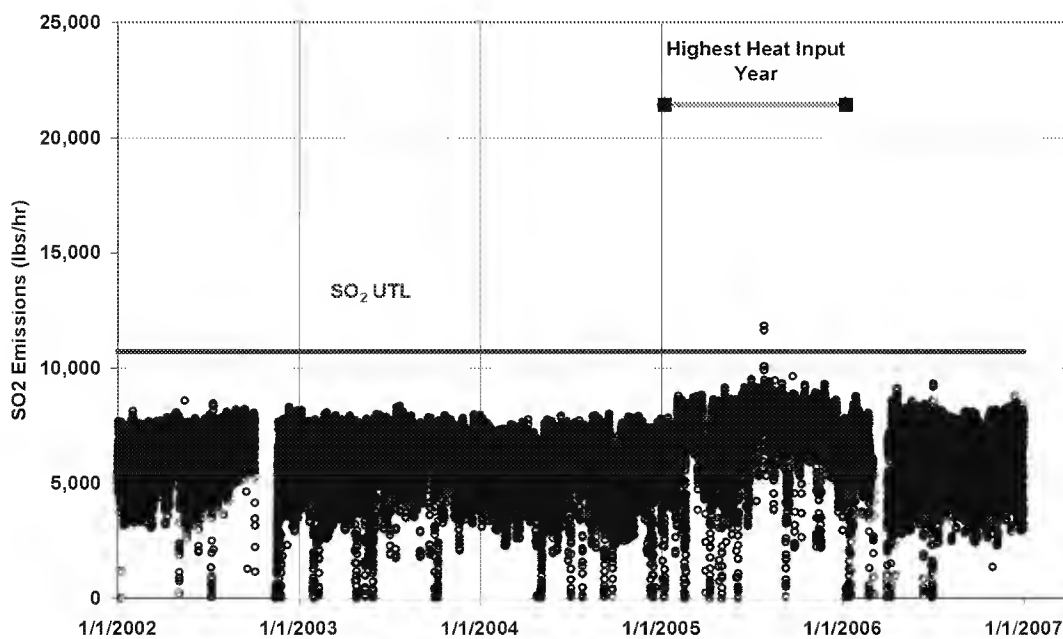
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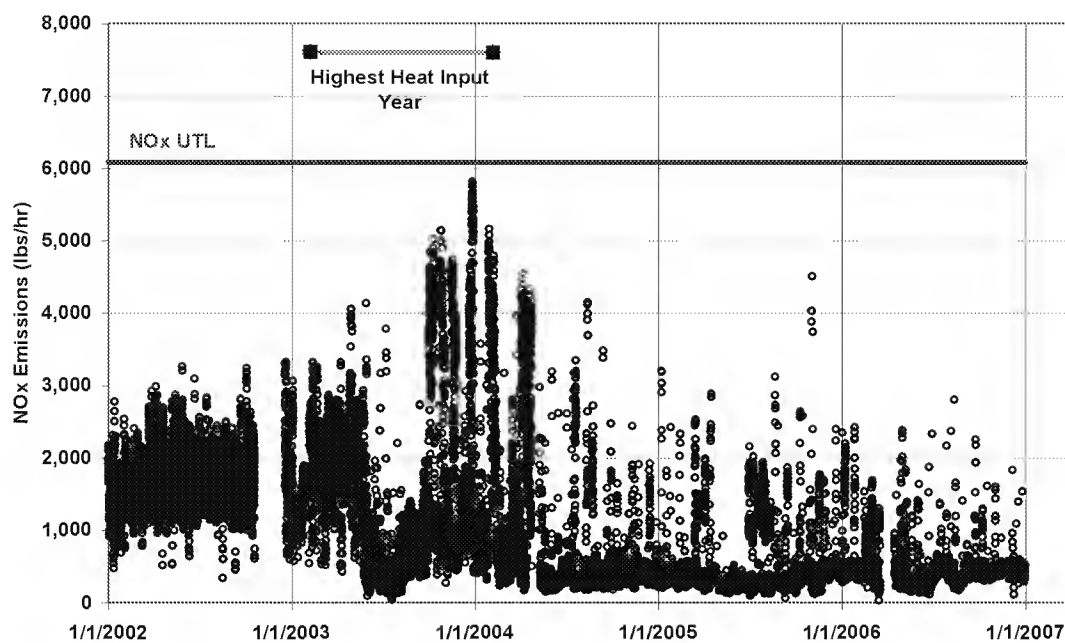
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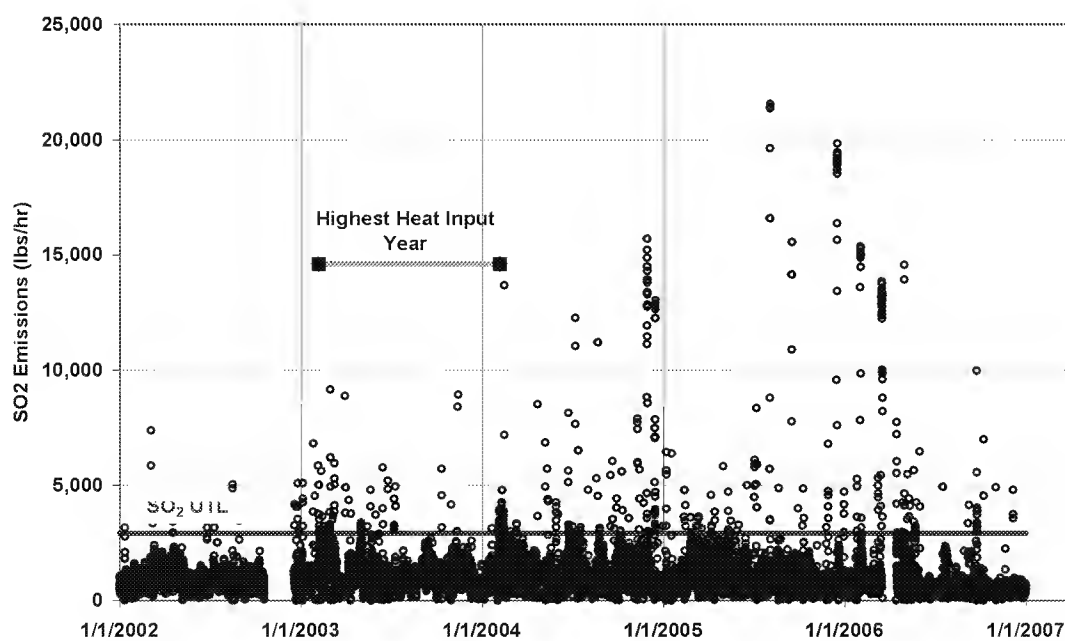
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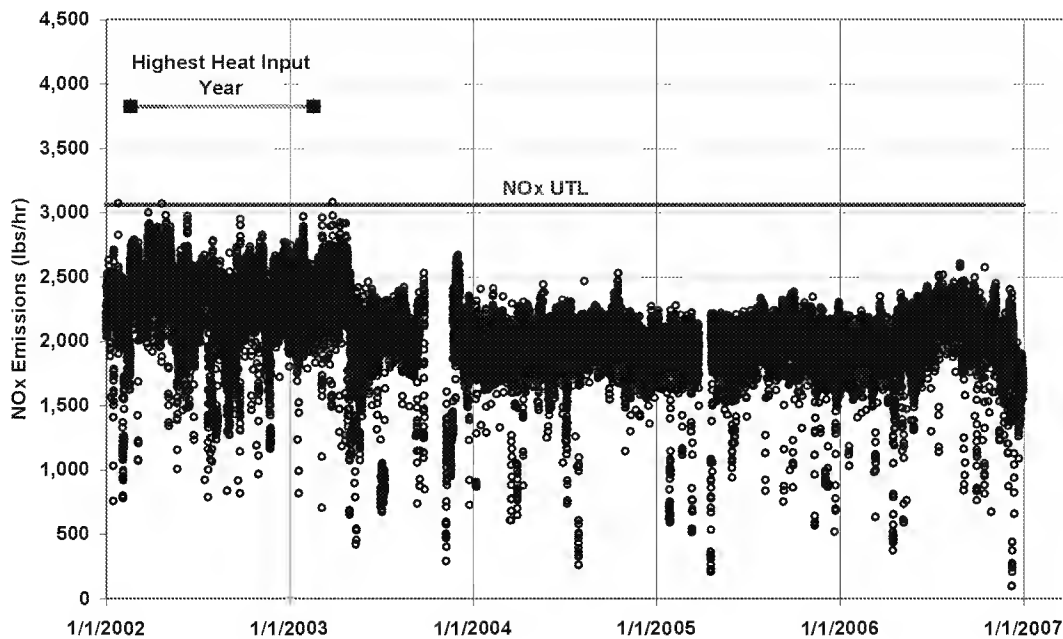
Unit H Hourly NO_x 2002 To 2006
Unfiltered Data



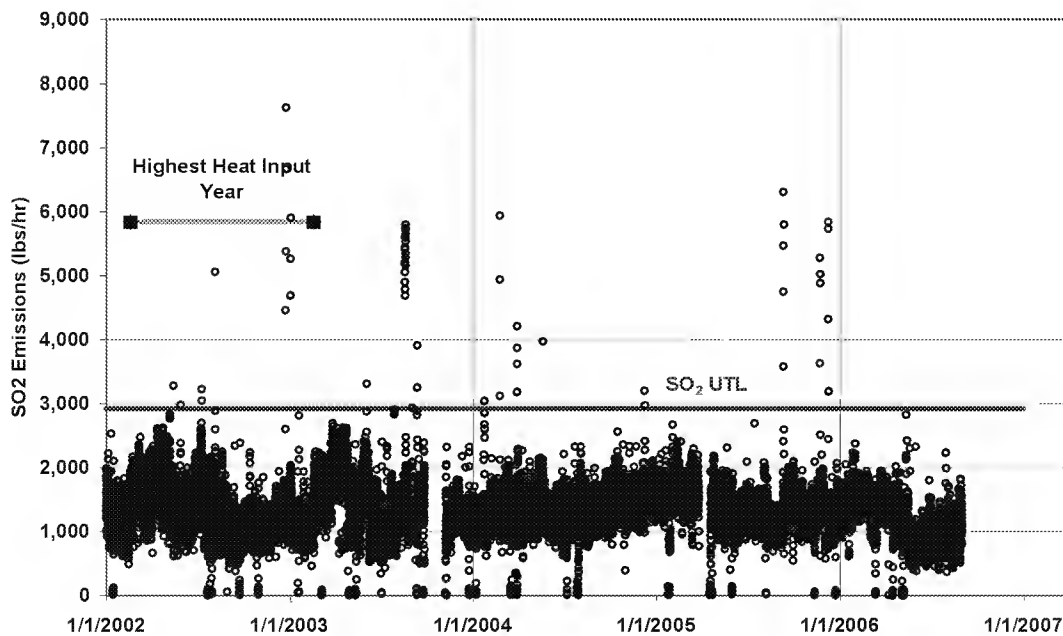
Unit H Hourly SO₂ 2002 To 2006
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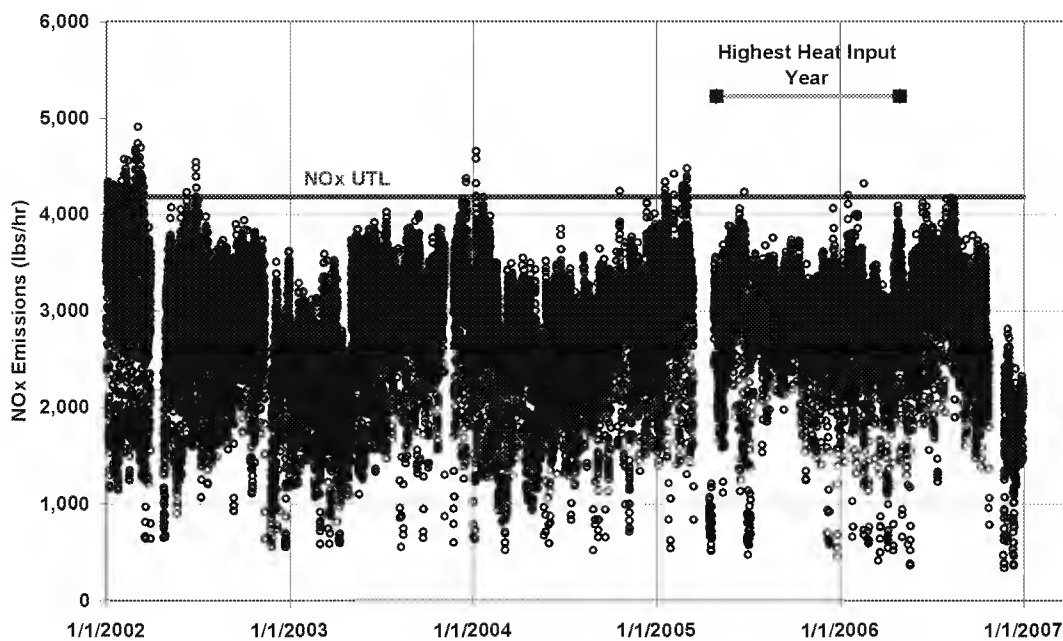
Unit D Hourly NO_x 2002 To 2006
Unfiltered Data



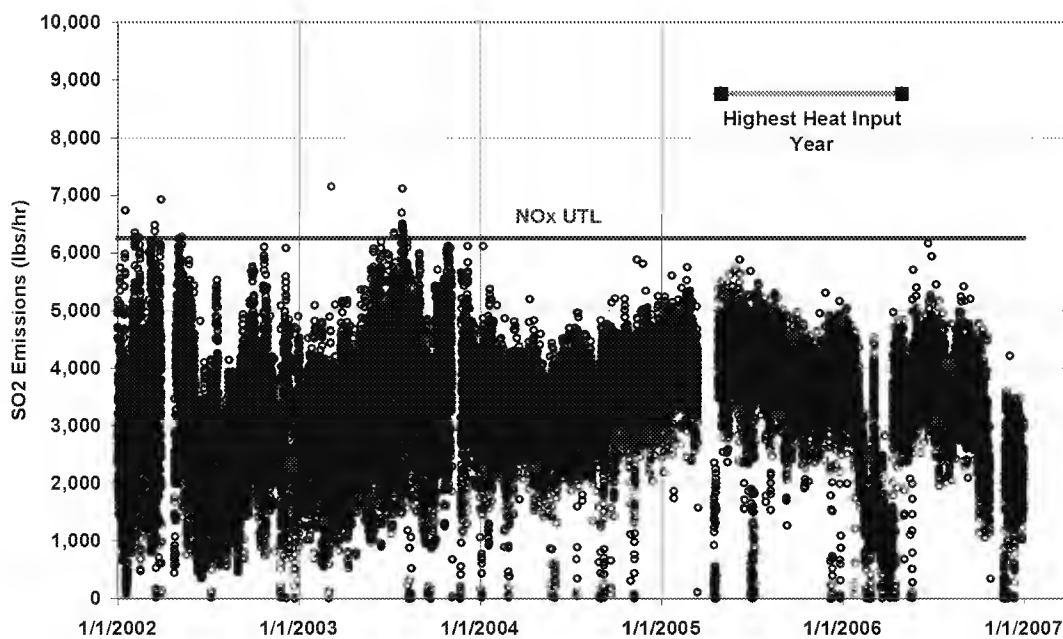
Unit D Hourly SO₂ 2002 To 2006
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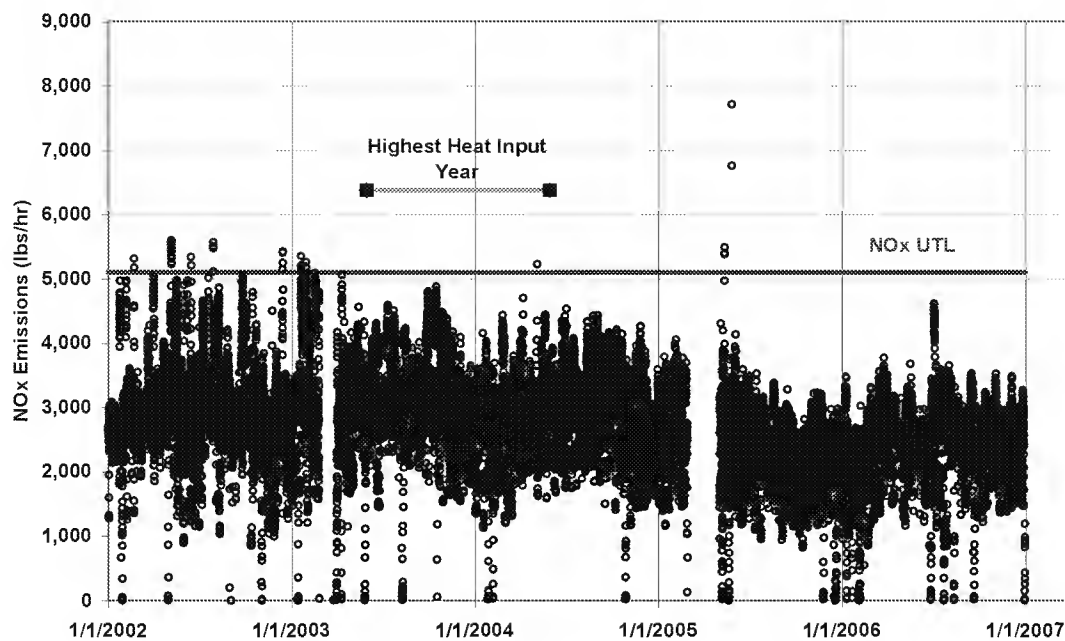
Unit F Hourly NO_x 2002 To 2006
Unfiltered Data



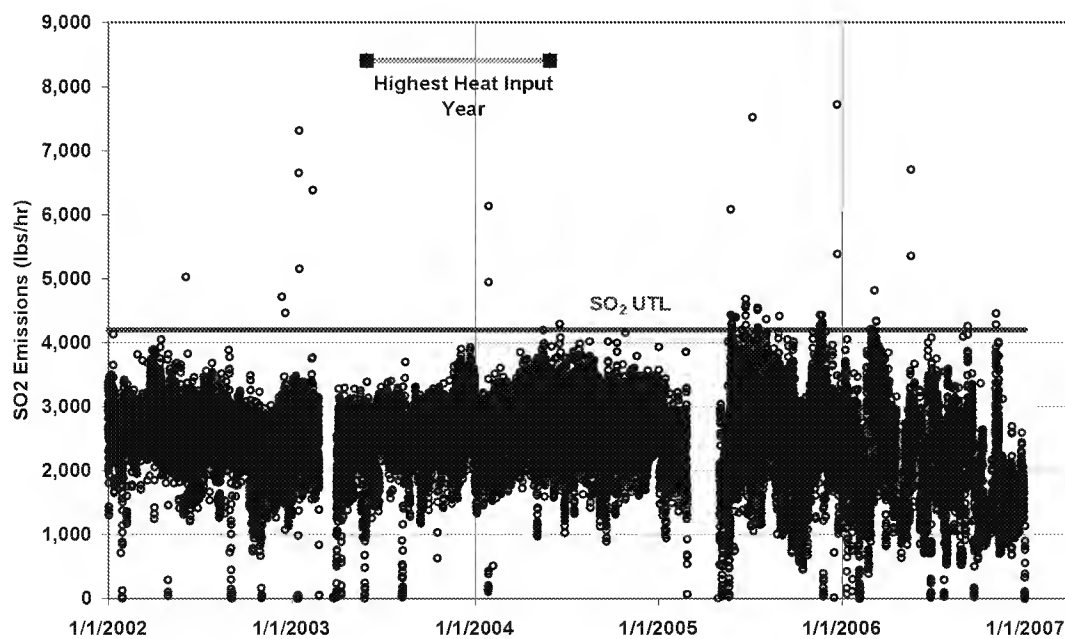
Unit F Hourly SO₂ 2002 To 2006
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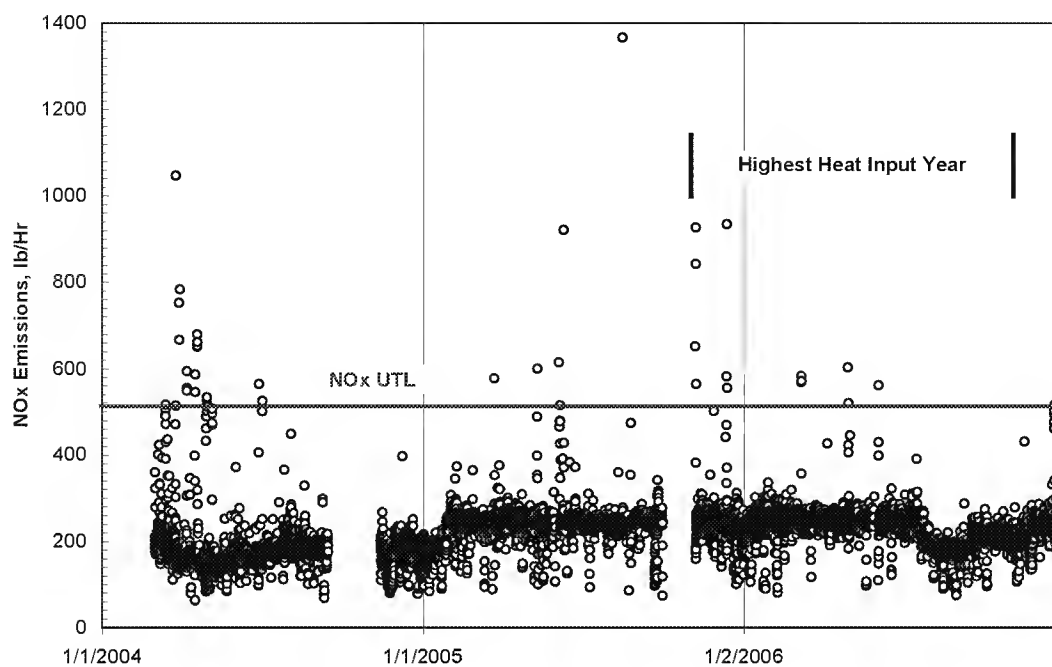
Unit G Hourly NO_x 2002 To 2006
Unfiltered Data



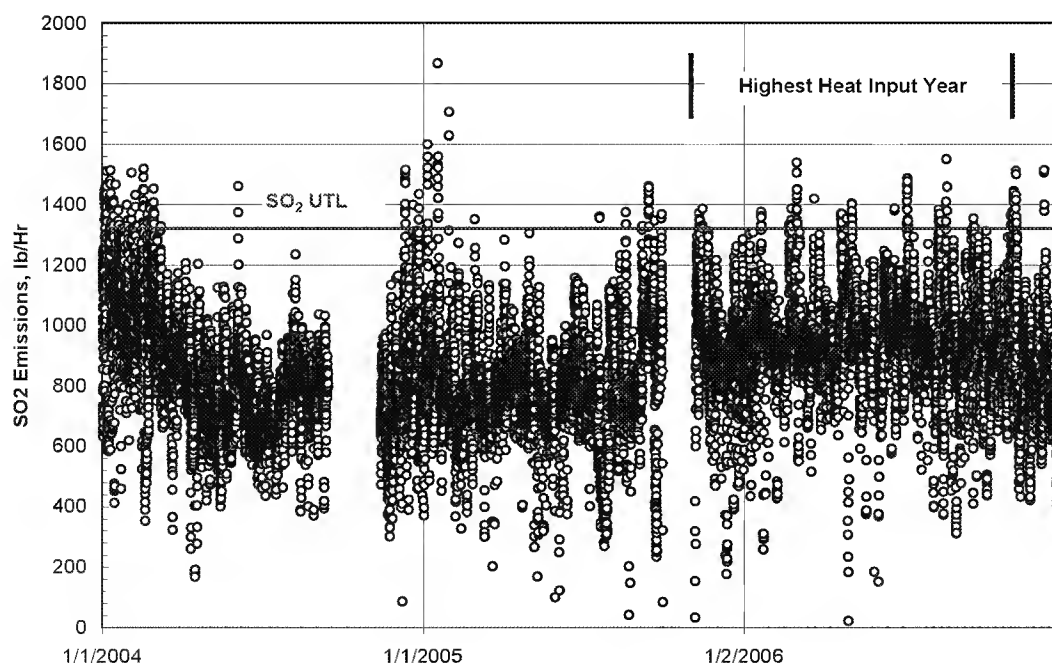
Unit G Hourly SO₂ 2002 To 2006
Unfiltered Data



Unit I Hourly NOx 3/1/04 to 2006

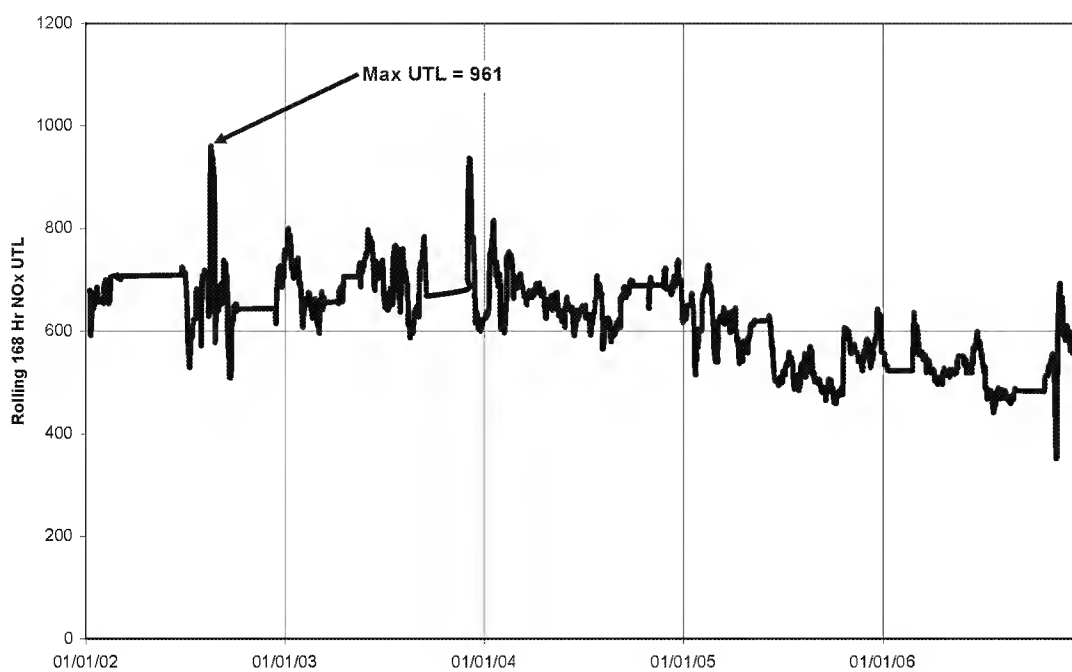


Unit I Hourly SO2 2004 to 2006

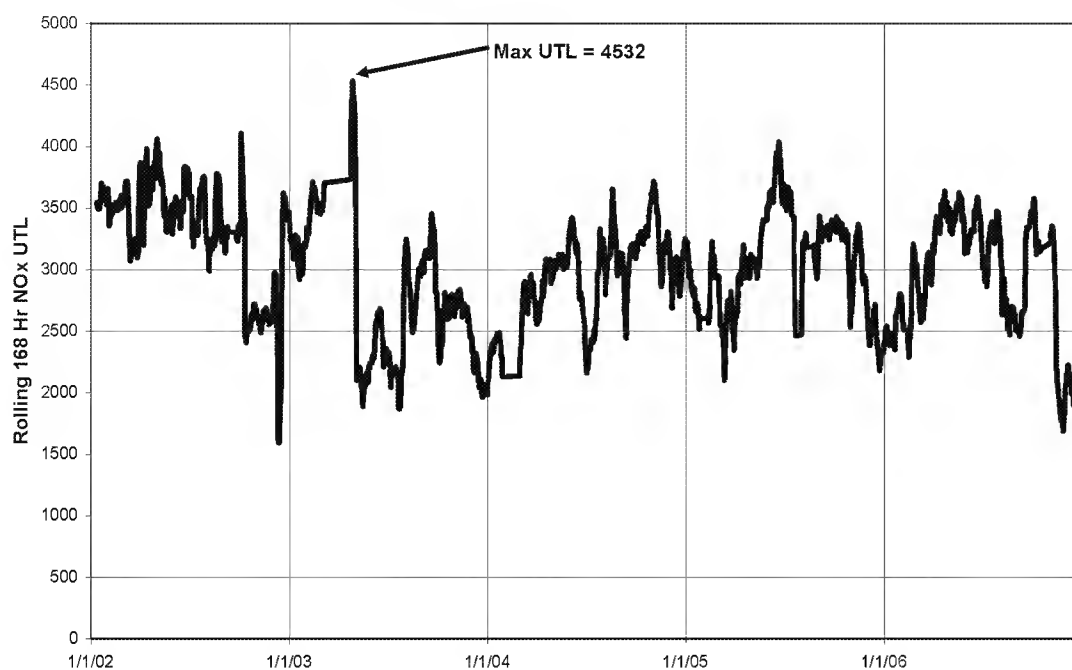


APPENDIX C

Five Year Revised UTL Analysis Data

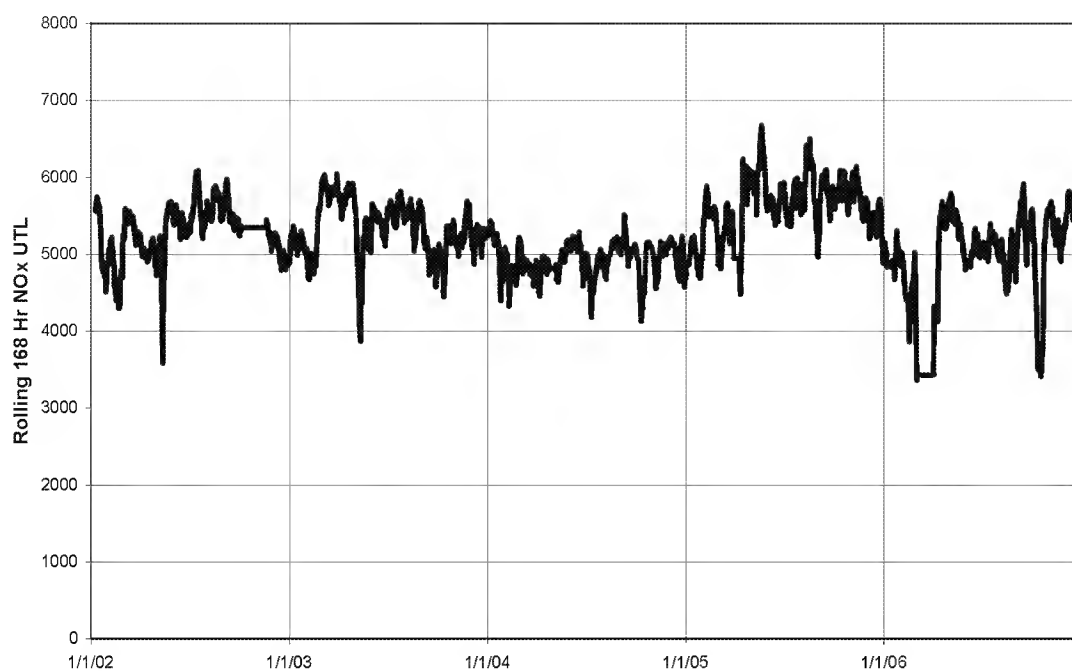
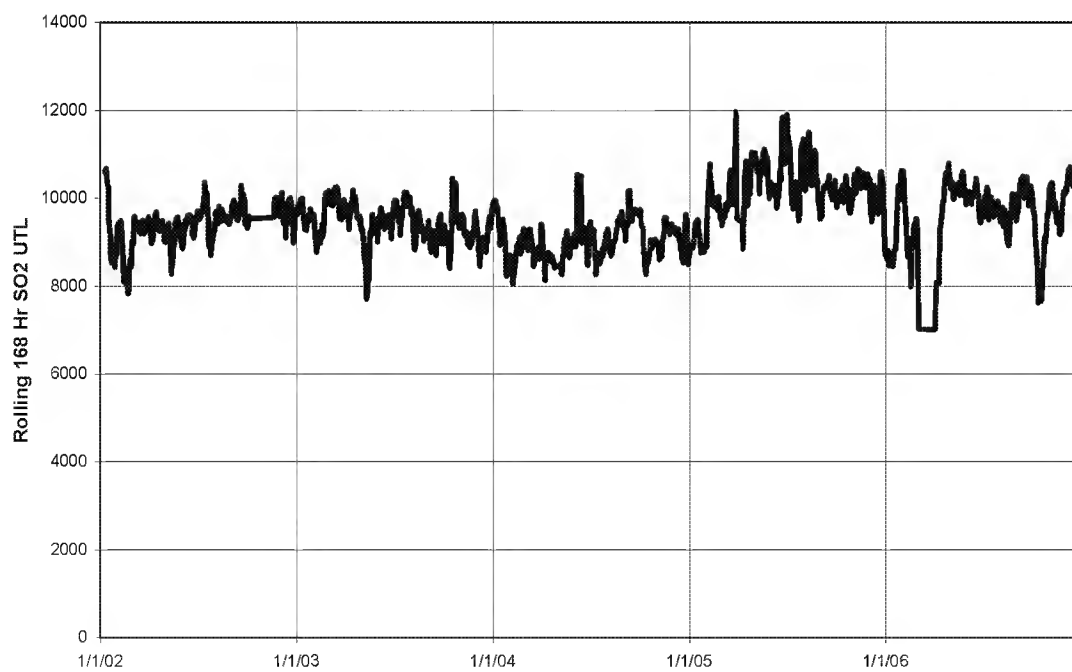
Unit C 168 Hour NOx UTL Results**Unit C 168 Hour SO2 UTL Results**

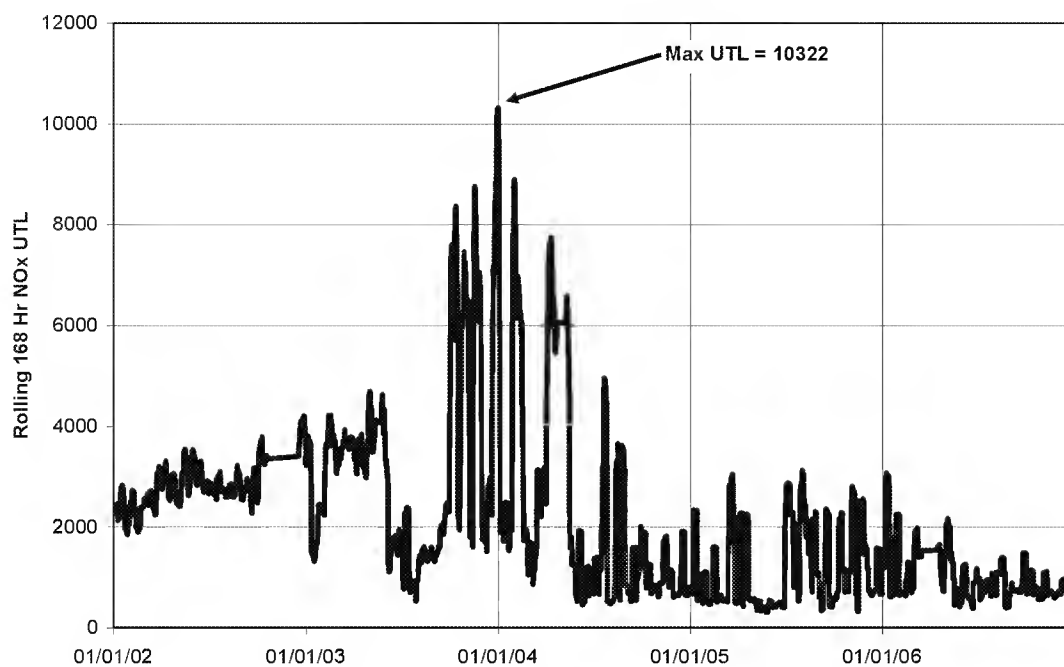
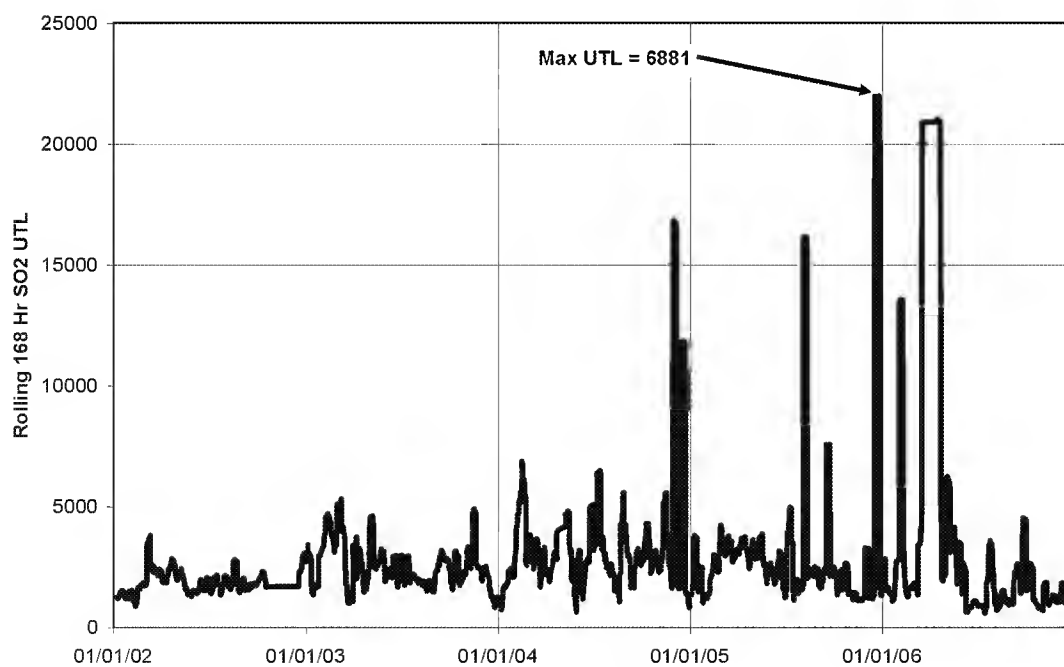
Unit A 168 Hour NOx UTL Results

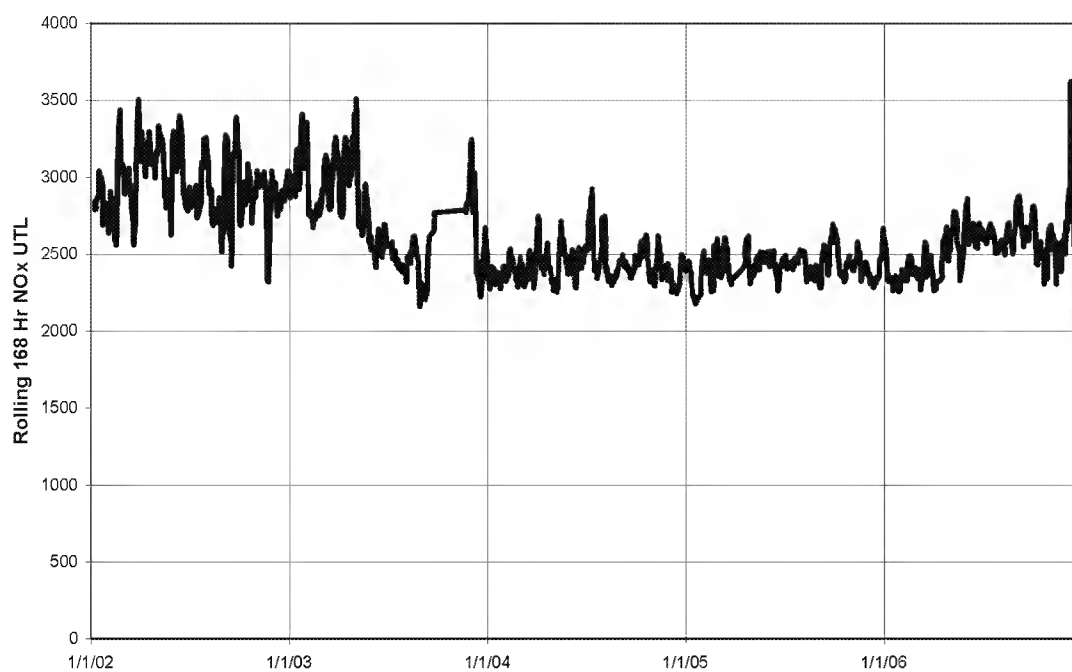
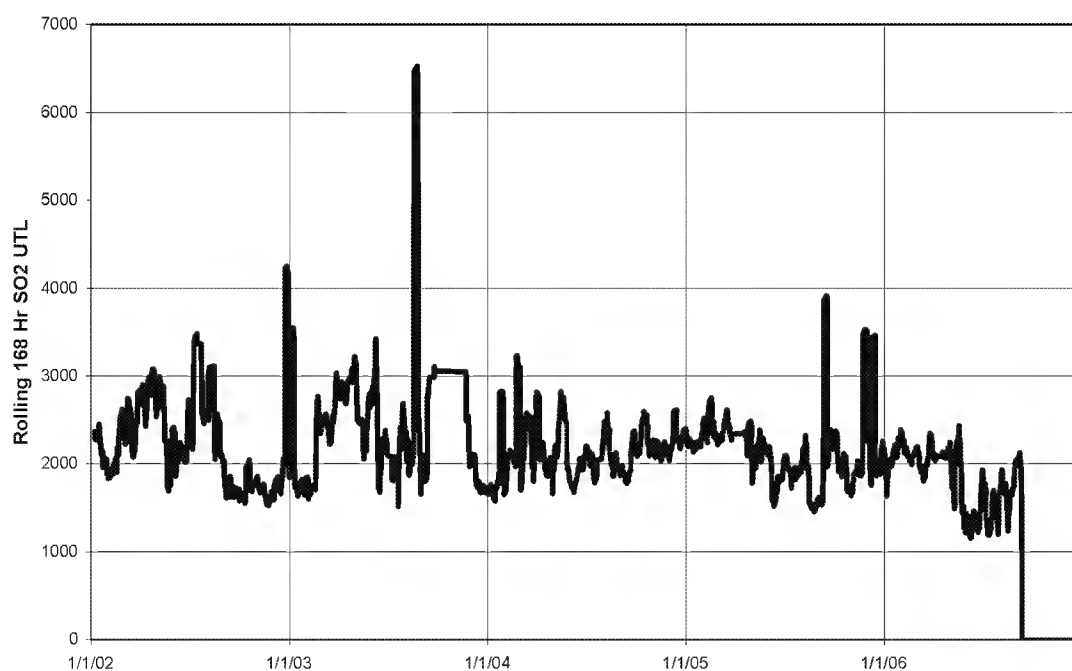


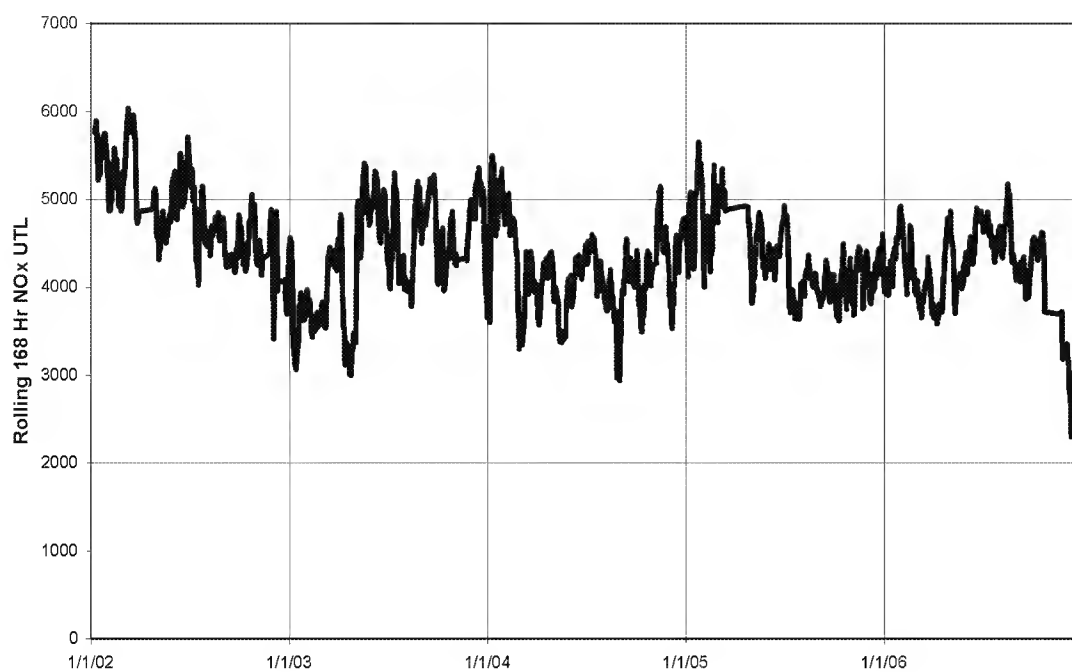
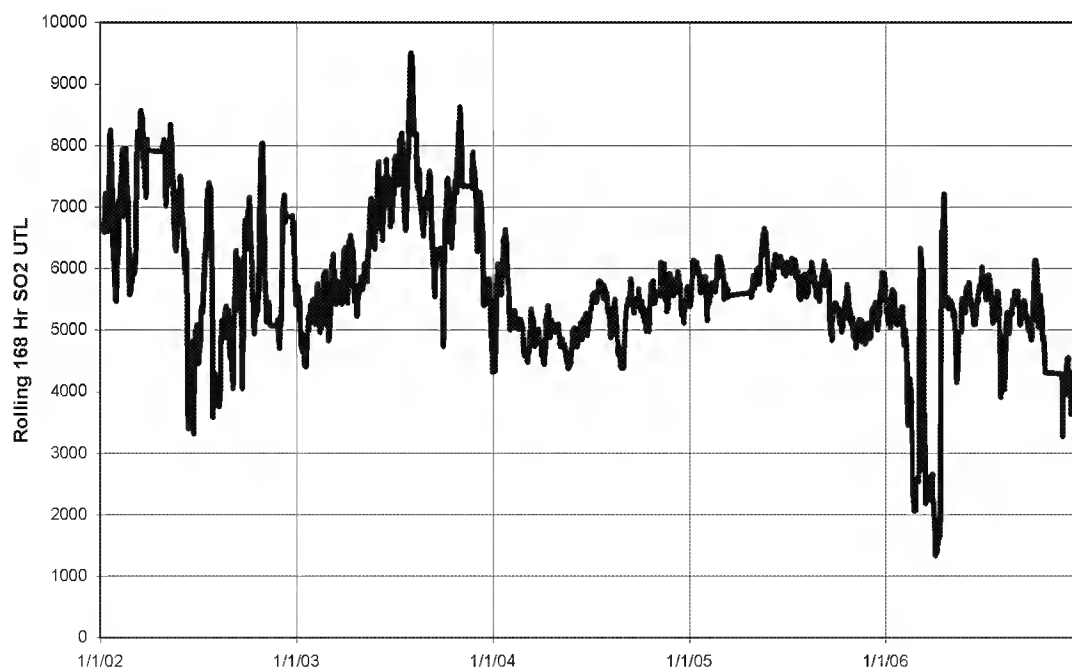
Unit A 168 Hour SO2 UTL Results



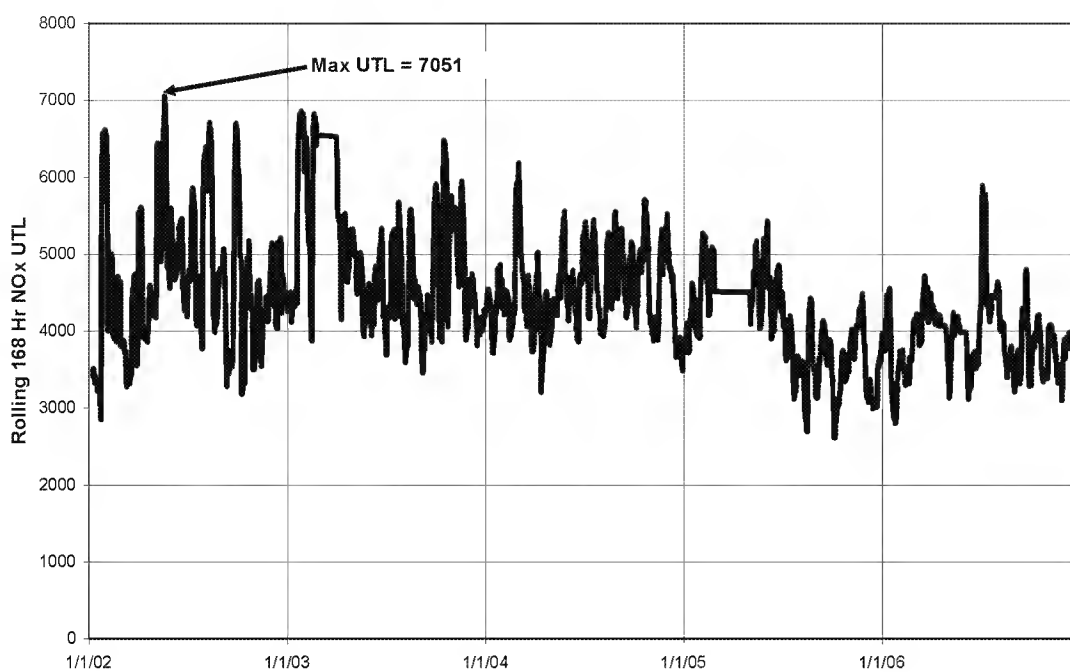
Unit B 168 Hour NOx UTL Results**Unit B 168 Hour SO2 UTL Results**

Unit H 168 Hour NO_x UTL ResultsUnit H 168 Hour SO₂ UTL Results

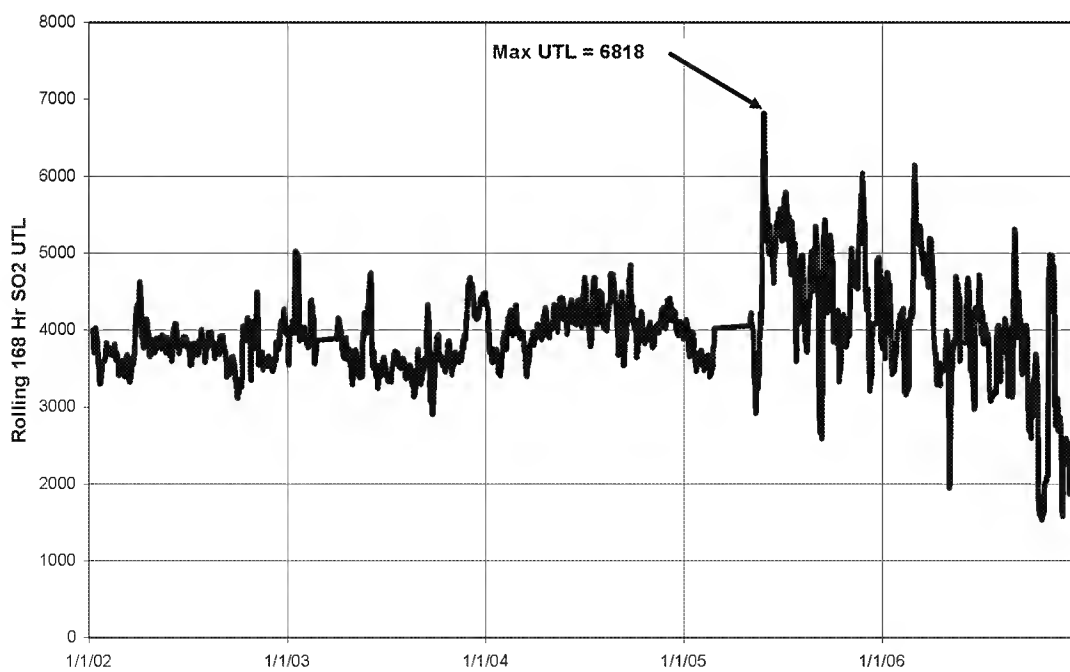
Unit D 168 Hour NOx UTL Results**Unit D 168 Hour SO2 UTL Results**

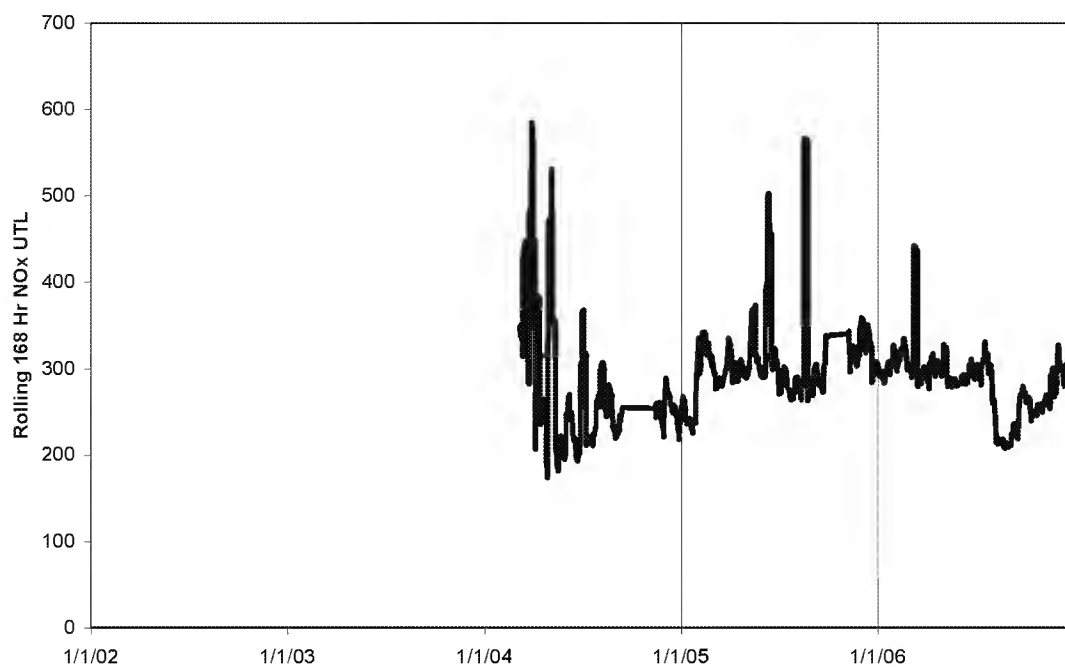
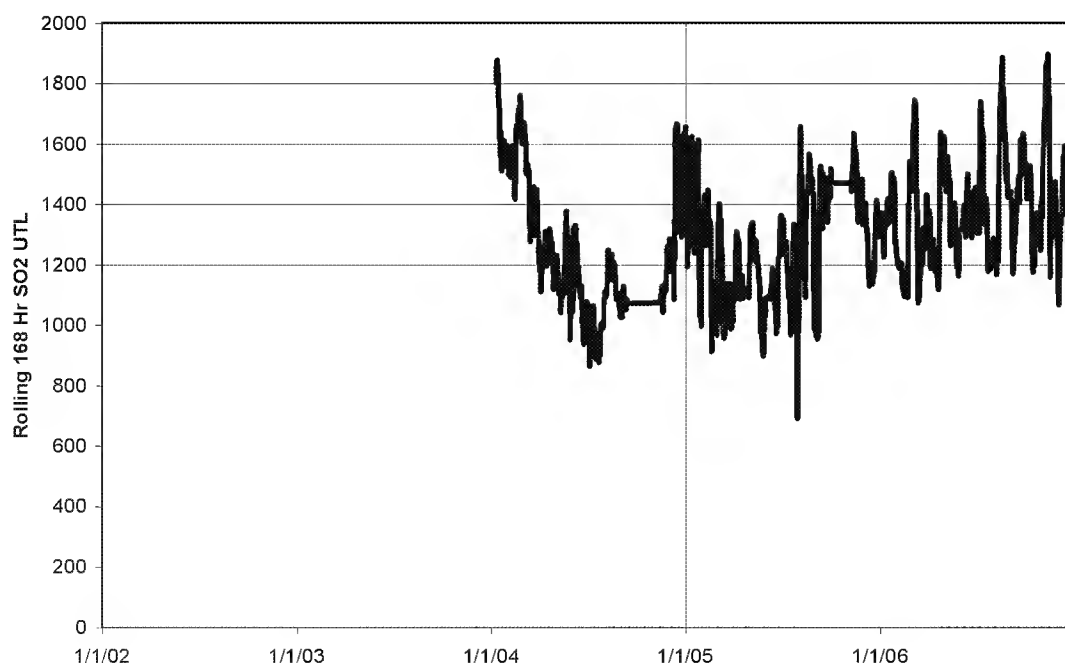
Unit F 168 Hour NOx UTL Results**Unit F 168 Hour SO2 UTL Results**

Unit G 168 Hour NOx UTL Results



Unit G 168 Hour SO2 UTL Results



Unit I 168 Hour NOx UTL Results**Unit I 168 Hour SO2 UTL Results**

Message

From: Brickey, Matthew [MBrickey@nma.org]
Sent: 9/6/2018 2:10:56 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
CC: Dominguez, Alexander [dominguez.alexander@epa.gov]; DeLuca, Isabel [DeLuca.Isabel@epa.gov]
Subject: RE: Invitation to Speak at National Mining Association's Environment Committee Meeting Oct. 18-19

Thank you Mandy! I appreciate you taking the time to come speak with NMA's environment committee. If you have any questions please let me know.

-Matt

From: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Sent: Thursday, September 6, 2018 10:02 AM
To: Brickey, Matthew <MBrickey@nma.org>
Cc: Dominguez, Alexander <dominguez.alexander@epa.gov>; DeLuca, Isabel <DeLuca.Isabel@epa.gov>
Subject: Re: Invitation to Speak at National Mining Association's Environment Committee Meeting Oct. 18-19

Hi Matthew,
 I'd be happy to. I'm looping in Alex and Isabel to help confirm logistics and run this through ethics. One of us will follow up with the official confirmation soon.

I hope all is well.

Best,
 Mandy

Sent from my iPhone

On Sep 6, 2018, at 8:56 AM, Brickey, Matthew <MBrickey@nma.org> wrote:

Ms. Gunasekara:

On behalf of the National Mining Association (NMA), I would like to invite you to address a broad section of the mining industry at our upcoming meeting of NMA's Environment Committee; a formal invitation is attached. The meeting will be held on Oct. 18 and 19, 2018, at the Renaissance Washington, D.C. Downtown Hotel located at 999 Ninth Street, N.W., Washington, DC. We would welcome an opportunity for you to meet with our members for approximately 60 minutes during either day. Our meeting will begin on Oct. 18 at 11 a.m. and end the following day by 1 p.m. We are currently flexible on speaker times.

Thank you in advance for your consideration,

Matthew Brickey

<image001.png>

Matthew Brickey
 Director, Air Quality
 National Mining Association
 101 Constitution Ave. NW, Suite 500 East
 Washington, D.C. 20001
 Phone: (202) 463-2600

Direct: (202) 463-2608
mbrickey@nma.org

<Mandy Gunasekara Invite.pdf>

Message

From: Abdnor, Jon (Thune) [Jon_Abdnor@thune.senate.gov]
Sent: 9/6/2018 7:19:11 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Frye, Tony (Robert) [frye.robert@epa.gov]
Subject: RVP agreement
Attachments: ATT00001.txt

Good afternoon Mandy and Tony,

As we near President Trump's visit to South Dakota, there has been buzz that we might soon see details or an announcement on RVP. Secretary Perdue said on August 29th that he had spoken with the president, who said, "get with the EPA administrator and y'all get me something next week I can announce." Are you able to confirm whether a proposal has been finalized, if it would be announced in the coming days, and shed light on what the proposal might include?

Thanks for any information you can share.

Regards,

Jon

Desk: 202-224-4238

Jonathan Abdnor

Military Legislative Assistant | Office of U.S. Senator John Thune
511 Dirksen Senate Office Building | Washington, DC 20510
Office: (202) 224-2321 | Fax: (202) 228-5429

Follow Senator Thune:

Message

From: Hilary_Moffett@oxy.com [Hilary_Moffett@oxy.com]
Sent: 9/14/2018 2:54:26 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Hello! (and CAFE)
Attachments: Hilary Moffett.vcf

Hey lady,

I hope this email finds you well. First, I wanted to reach out say hello. (HI!!!) Hope all is well. I'm dying for an update!

Second, wanted to share my new contact info (attached).

Third, I wanted to reach out about CAFÉ. I'm handling some of the chemical issues for Oxy now and wanted to briefly discuss. Are you free to chat sometime? Maybe coffee if you have time?

Let me know what works! Can't wait to see you and catch up.

Thanks,
Hilary

Hilary Moffett

Sr. Director, Government Affairs
202-857-3058 (direct)
612-710-8696 (cell)



Message

From: Jaber, Makram [mjaber@hunton.com]
Sent: 8/29/2018 10:01:00 PM
To: Dominguez, Alexander [dominguez.alexander@epa.gov]
CC: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; DeLuca, Isabel [DeLuca.Isabel@epa.gov]
Subject: RE: Invitation to Speak at "Insights into Environmental Law & Policy" Event on October 24, 2018
Attachments: Event Information Form -- Gunasekara -- 10-24-18.pdf

Hi Alex,

Please find attached the completed form. Let me know if you need any other information.

Best,

Makram

From: Dominguez, Alexander [mailto:dominguez.alexander@epa.gov]
Sent: Wednesday, August 15, 2018 10:21 AM
To: Jaber, Makram
Cc: Gunasekara, Mandy; DeLuca, Isabel
Subject: RE: Invitation to Speak at "Insights into Environmental Law & Policy" Event on October 24, 2018

Thank you, Makram. Although I believe I have everything required, for the sake of checking all the boxes, when you have a moment could you please fill out the attached event form? I've also cc'd Isabel Deluca in our communications office for her awareness.

Appreciate it,
 Alex

Alex Dominguez
 Policy Analyst to the Principal Deputy
 Office of Air and Radiation
 U.S. Environmental Protection Agency

From: Jaber, Makram [mailto:mjaber@hunton.com]
Sent: Tuesday, August 14, 2018 1:02 PM
To: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>; Dominguez, Alexander <dominguez.alexander@epa.gov>
Subject: Invitation to Speak at "Insights into Environmental Law & Policy" Event on October 24, 2018

Dear Mandy,

Thank you for agreeing to participate in the "Insights into Environmental Law & Policy: A Conversation with Key Regulators" event on October 24, 2018. The location and format will be similar to last year's event (last year's agenda is attached). The event will be held at Hunton Andrews Kurth's offices at 2200 Pennsylvania Ave. NW in DC. It will be held in the afternoon, and we are targeting your session to start at about 2 pm and end no later than 3 pm (it will be 45-60 minutes, depending on how the final agenda shapes up). Your session will have you as the panelist/interviewee, with Allison Wood as the moderator. We are flexible as to time (if you prefer a later session, let us know) as well as content – we're imagining a short opening statement by you, then a few Q&A's with the moderator, then a few Q&A's with the audience. As has been the case for the last several years, the audience likely would be general counsels and in-house environmental, health and safety counsel (not exclusive to Hunton clients). We would love for you to stay for the reception following the event.

Dear Alex,

Please let me know if you need anything from me in terms of forms or the like.

Thank you.

Makram

HUNTON
ANDREWS KURTH

Makram Jaber

Partner

mjaber@HuntonAK.com

p 202.955.1567

[bio](#) | [vCard](#)

Hunton Andrews Kurth LLP
2200 Pennsylvania Avenue, NW
Washington, DC 20037

HuntonAK.com

This communication is confidential and is intended to be privileged pursuant to applicable law. If the reader of this message is not the intended recipient, please advise by return email immediately and then delete this message and all copies and backups thereof.

Message

From: Julia Rege [JRege@globalautomakers.org]
Sent: 8/29/2018 2:09:20 PM
To: Molina, Michael [molina.michael@epa.gov]; Dickerson, Aaron [dickerson.aaron@epa.gov]
CC: Michelle Hernandez [mhernandez@globalautomakers.org]; Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: RE: Request meeting with Acting Administrator Wheeler

Michael and Aaron,

Just wanted to follow up and see if there is any additional information I can provide to assist with my request, below. Please let me know.

Best, Julia
 202.650.5559

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From: Julia Rege
Sent: Monday, August 20, 2018 10:45 AM
To: 'molina.michael@epa.gov' <molina.michael@epa.gov>; 'dickerson.aaron@epa.gov' <dickerson.aaron@epa.gov>
Cc: Michelle Hernandez <mhernandez@globalautomakers.org>
Subject: Request meeting with Acting Administrator Wheeler

Michael and Aaron,

I would like to request to set up a meeting between Acting Administrator Wheeler and the Association of Global Automakers. We have not yet met with Acting Administrator Wheeler, and so the primary purpose of this meeting would be a meet and greet. However, given that there is much going on in the light-duty vehicle greenhouse gas and fuel economy world right now, I would also expect there to be much focus on this topic. Global Automakers represent members' account for 47 percent of retail vehicle sales in the United States and include Honda, Aptiv, Aston Martin, Bosch, Byton, Denso, Ferrari, Hyundai, Isuzu, Kia, Maserati, McLaren, Nissan, NXP Semiconductors, Sirius XM, Subaru, Suzuki, and Toyota.

I understand the Acting Administrator's schedule is busy, but I would like to suggest the following dates to see if they might work for a 45-minute meeting: September 17, September 18, and September 24 (afternoon only). I have copied John Bozzella's (President & CEO of Global Automakers) Executive Admin, Michelle Hernandez, who can assist in arranging dates per the Administrator's schedule, whether on the requested dates or otherwise.

Please let me know if you require any additional information for this request, and thank you in advance for your assistance.

Best, Julia

Julia Rege
 Director, Environment & Energy
 Association of Global Automakers, Inc. (Global Automakers)
 1050 K Street, NW, Suite 650
 Washington, DC 20001
 202.650.5559 (direct)
 202.650.5555 (main)
jrege@globalautomakers.org

GlobalAutomakers 



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Message

From: Ed Cohen [Edward_Cohen@hna.honda.com]
Sent: 9/6/2018 4:42:26 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
CC: Rakosnik, Delaney [rakosnik.delaney@epa.gov]; Lewis, Josh [Lewis.Josh@epa.gov]; Atkinson, Emily [Atkinson.Emily@epa.gov]
Subject: RE: Meeting With Bill

Thanks. You must be drinking from a fire hose.

From: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Sent: Thursday, September 06, 2018 12:34 PM
To: Ed Cohen <Edward_Cohen@hna.honda.com>
Cc: Rakosnik, Delaney <rakosnik.delaney@epa.gov>; Lewis, Josh <Lewis.Josh@epa.gov>; Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: Re: Meeting With Bill

Hey Ed,
 Apologies for missing the voicemail. I'm looping in Bills scheduling team to see if we can work something out.
 Best,
 Mandy

Sent from my iPhone

On Sep 6, 2018, at 11:43 AM, Ed Cohen <Edward_Cohen@hna.honda.com> wrote:

Mandy –

I left you a voice mail on Tuesday asking whether Bill might have time to talk with the Honda gang (Robert Bienenfeld is in from California) Friday morning. Would that be possible?

Thanks very much.

Ed

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Message

From: Raburn, Janice [Janice.Raburn@bp.com]
Sent: 8/30/2018 9:09:38 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
CC: Dominguez, Alexander [dominguez.alexander@epa.gov]
Subject: RE: RIN market briefing

Mandy,
Thanks for the quick response. I'll get back to you and Alex as soon as I can get with my team.
Best,
Janice

From: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Sent: Thursday, August 30, 2018 4:58 PM
To: Raburn, Janice <Janice.Raburn@bp.com>
Cc: Dominguez, Alexander <dominguez.alexander@epa.gov>
Subject: Re: RIN market briefing

Janice,
Great catching up for a bit and as promised, I'm looping in Alex. That first week of October (excluding Monday) looks good from my end. Let us know what works for your team and we'll get the meeting set up.
Best,
Mandy

Sent from my iPhone

On Aug 30, 2018, at 4:11 PM, Raburn, Janice <Janice.Raburn@bp.com> wrote:

Hello Mandy,

Thank you and Acting Administrator Wheeler for meeting with us on Monday. To follow up as we discussed, BP would like to meet with you to provide our perspective on the RIN market. Please let me know if there are particular dates that do or do not work for you. Would September 18, 19, or 20 work for you?

Best regards,
Janice

Janice K Raburn

BP America Inc. | Senior Director, Fuels Regulatory Advocacy

office: 202.346.8516 | mobile: 202.210.8540
1101 New York Avenue, NW Suite 700 | Washington, DC 20005

Message

From: Raburn, Janice [Janice.Raburn@bp.com]
Sent: 9/6/2018 1:50:58 AM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Dominguez, Alexander [dominguez.alexander@epa.gov]
Subject: BP RIN Market Briefing

Mandy and Alex,

We talked last week about arranging a one-hour RIN Market briefing for Mandy. She was unable to attend a briefing BP provided on July 2 to Bill Wehrum, Chris Grundler, and several others from OTAQ. This would be a follow-up to a meeting between BP and Acting Administrator Wheeler and Mandy on August 27.

Mandy and I talked last week and agreed to try to schedule for the first week of October. Please let me know if any of the following dates would work - this is our order of preference:

- Thursday, October 4
- Wednesday, October 3
- Friday, October 5

Also, FYI, to be efficient with those traveling from Chicago, I will try to arrange a briefing the same day with EPA OTAQ folks, as BP would like to provide our suggestions for the RFS Reset rulemaking. I expect several OTAQ folks will be on video from Ann Arbor.

Best regards,
Janice

Janice K Raburn

BP America Inc. | Senior Director, Fuels Regulatory Advocacy

office: 202.346.8516 | mobile: 202.210.8540
1101 New York Avenue, NW Suite 700 | Washington, DC 20005

Message

From: Ed Cohen [Edward_Cohen@hna.honda.com]
Sent: 9/6/2018 3:43:02 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Meeting With Bill

Mandy –

I left you a voice mail on Tuesday asking whether Bill might have time to talk with the Honda gang (Robert Bienenfeld is in from California) Friday morning. Would that be possible?

Thanks very much.

Ed

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Message

From: Brickey, Matthew [MBrickey@nma.org]
Sent: 9/6/2018 3:41:38 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
CC: Dominguez, Alexander [dominguez.alexander@epa.gov]; DeLuca, Isabel [DeLuca.Isabel@epa.gov]
Subject: RE: Invitation to Speak at National Mining Association's Environment Committee Meeting Oct. 18-19
Attachments: Draft Agenda - NMA Fall Environment Committee Meeting.doc

Hi Mandy,

I wanted to provide you with a draft agenda of NMA's Fall Environment Committee Meeting that includes time slots that are available for speakers. There are five time slots still available on Thursday, October 18 and two available for Friday, October 19.

Thank you,

Matt

From: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Sent: Thursday, September 6, 2018 10:02 AM
To: Brickey, Matthew <MBrickey@nma.org>
Cc: Dominguez, Alexander <dominguez.alexander@epa.gov>; DeLuca, Isabel <DeLuca.Isabel@epa.gov>
Subject: Re: Invitation to Speak at National Mining Association's Environment Committee Meeting Oct. 18-19

Hi Matthew,
I'd be happy to. I'm looping in Alex and Isabel to help confirm logistics and run this through ethics. One of us will follow up with the official confirmation soon.

I hope all is well.

Best,
Mandy

Sent from my iPhone

On Sep 6, 2018, at 8:56 AM, Brickey, Matthew <MBrickey@nma.org> wrote:

Ms. Gunasekara:

On behalf of the National Mining Association (NMA), I would like to invite you to address a broad section of the mining industry at our upcoming meeting of NMA's Environment Committee; a formal invitation is attached. The meeting will be held on Oct. 18 and 19, 2018, at the Renaissance Washington, D.C. Downtown Hotel located at 999 Ninth Street, N.W., Washington, DC. We would welcome an opportunity for you to meet with our members for approximately 60 minutes during either day. Our meeting will begin on Oct. 18 at 11 a.m. and end the following day by 1 p.m. We are currently flexible on speaker times.

Thank you in advance for your consideration,

Matthew Brickey

<image001.png>

Matthew Brickey
Director, Air Quality
National Mining Association
101 Constitution Ave. NW, Suite 500 East
Washington, D.C. 20001
Phone: (202) 463-2600
Direct: (202) 463-2608
mbrickey@nma.org

<Mandy Gunasekara Invite.pdf>

Message

From: Carrie Annand [carrie@usabiomass.org]
Sent: 1/22/2019 2:48:24 PM
To: Wehrum, Bill [Wehrum.Bill@epa.gov]; Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
CC: Stacy Cook [scook@kodaenergy.com]; Atkinson, Emily [Atkinson.Emily@epa.gov]
Subject: Letter from Koda Energy re: eRINs
Attachments: Koda Energy LLC Letter to EPA 1-21-19 final.pdf

Dear Assistant Administrator Wehrum and Ms. Gunasekara,

Attached is a letter being sent today to Acting Administrator Wheeler from Stacy Cook, president of Koda Energy LLC, a combined heat and power biomass facility located in Shakopee, MN. He is requesting the EPA to process electric RIN applications for biomass power facilities.

Mr. Cook is copied on this email and is available at scook@kodaenergy.com or 952-641-3613. I am also available to answer any questions at carrie@usabiomass.org or 202-494-2493.

Thank you very much.

Best,
Carrie Annand

--

Carrie Annand
Executive Director

Mobile: (202) 494-2493
601 New Jersey Ave. NW, Suite 660 / Washington, DC / 20001
Twitter: [@USABiomass](https://twitter.com/USABiomass)
www.usabiomass.org



January 21st, 2019

The Honorable Andrew Wheeler
Acting Administrator
Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

Dear Acting Administrator Wheeler:

I write to you to urge the EPA to process applications enabling biomass power to generate credits under the Renewable Fuel Standard program. My company, Koda Energy LLC, is a biomass fueled combined heat and power (CHP) facility located in downtown Shakopee, MN, that provides significant support to the rural and urban economies in the Minneapolis region.

The 23.4 – megawatt facility is jointly owned by the Shakopee Mdewakanton Sioux Community, a federally recognized Indian tribe (SMSC), and Rahr Corporation, a family-owned producer and distributor of malt and brewing products for the beer, distilling, and wine making industries.

Since 2009 Koda Energy has been offering a practical solution for processing vast amounts of wood and agricultural byproduct wastes that are accumulating in the community and surrounding areas. Due to uncertain power purchase contracts and other economic influences that are out of our control, our facility may be approaching imminent shutdown. **The ability to participate in the RFS program will help our facility remain open, continuing to provide these much needed benefits.**

Our facility is a key economic contributor to our rural Minnesota region. In addition to providing thermal energy for malting barley that is used in craft, regional, and national beer production, and helping local businesses and communities manage waste wood and grain byproducts, Koda Energy LLC currently contributes approximately \$17 million annually into the local economy in the form of jobs, fuel purchases, contractors, and equipment. The SMSC and Rahr Corporation have each invested tens of millions of private dollars into the facility for construction, capital improvements, and continuing operations expenses.

Koda Energy's sources of biomass are clean waste wood from storms, disease, tree trimmings, and recycling operations, as well as waste grain hulls and dust from grain milling and malting operations. The facility takes some of the urban wood waste created by removing trees in the region that are diseased by the emerald ash borer, a pest that particularly afflicts the State of Minnesota with its estimated one billion ash trees. The plant combusts approximately 180,000 tons of grain byproducts and wood waste annually. Over the next several years it is anticipated that there will be a rapid expansion of the number of diseased ash trees in the State of Minnesota, and Koda Energy LLC stands as a willing partner in helping to control this glut of woody waste by converting it to renewable energy. Koda Energy LLC must survive financially to be of service to the state and region in these efforts.

In the State of Minnesota, several biomass power facilities have recently been shut down, idled, repowered, or dismantled. The result of this is several hundred thousand tons of biomass waste material being left to decay without harnessing the energy, and hundreds of

career jobs with benefits being lost, all at a time when the emerald ash borer is just beginning to decimate the ash forestry in the state. The primary reason for this is financial in nature.

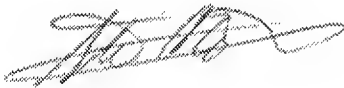
Biomass power does not receive a revenue stream from the production tax credit, and therefore cannot sell electricity into the public grid for less than the cost of producing the energy. The Public Utilities Commissions are focused on the cost of a watt when determining allowable rates in purchase power agreements, and often do not account for the subsidies paid that allow for the lower price delivered to the public grid by other renewables. This lends to creating financial winners in the subsidized energy source, and financial losers when no subsidy is available. **Biomass energy needs a level playing field to compete, survive, and thrive.**

Eleven years ago, Congress agreed that electricity generated from renewable sources should be eligible for incentives under the Renewable Fuel Standard (RFS) program. Four years ago, EPA approved application of this program to renewable energy sources, such as bioenergy plants. The Agency has since determined that certain solid forms of biomass fuel qualify under the RFS program. However, to date EPA has failed to act on this approval by processing formal applications from a number of renewable electricity producers seeking certification and identification numbers (Renewable Identification Number, or "RIN") under the RFS program. We understand that EPA now faces a four-year backlog of applications from power producers seeking registration, with many more requests expected to follow.

Koda Energy LLC intends to seek certification under the RFS program. At the same time that our services are increasingly needed in the state's urban and rural landscape, federal and state policy is instead bolstering other sources of energy. It is essential to the financial well-being of Koda Energy LLC that this program be extended to our plant, and it is only fair that biomass power plants be entitled to benefit from the RFS program on an equal footing with other generators of renewable energy, such as wind and solar.

We respectfully urge you to act on all outstanding registration requests as expeditiously as possible, and to issue a final conclusion on the regulatory structure for the electric RIN pathway.

Respectfully yours,



Stacy A. Cook
President, Koda Energy LLC

c. The Honorable Amy Klobuchar
The Honorable Tina Smith
The Honorable Angie Craig

Message

From: Brian Johnson [johnsonb@api.org]
Sent: 8/22/2018 5:02:21 PM
To: Brian Johnson [johnsonb@api.org]
Subject: Moving on...
Attachments: ATT00001.txt; Brian Marshall Johnson.vcf

Colleagues / Friends,

Apologies if you receive this more than once; I wanted to let you know this Friday will be my last day at API.

Eight years ago I came to API. I am leaving having proudly been a part of many successful initiatives while learning from some of the smartest people I've met in both a fantastic industry and in public service.

From working to pass Trade Promotion Authority, Customs Reauthorization, and of course, the Tax Cuts and Jobs Act of 2017 (finally!) among others, I can truly say I'm leaving the industry better than when I started. None of which could have happened without being part of a great team and working with talented people on the Hill and in two Administrations. I will be moving forward a smarter professional and a better person than when I arrived because of everything you all have taught me. Thank you.

I'm not going far. Starting September 10th I will join [The Vogel Group](#) as a principal where I will focus on assisting current clients and growing their global government affairs practice and advisory services.

I hope you'll stay in touch using my new contact information attached, or my [LinkedIn](#).

Sincerely,

Brian

PS – if you, or someone you know, is interested in applying for the API Director of Federal Relations – Tax position, [please see here](#).



Brian M Johnson MPA
Director – Federal Relations

American Petroleum Institute
1220 L Street NW
Washington, DC 20005
202.682.8509 | www.api.org | [LinkedIn](#)

This e-mail is intended only for the individual to whom it is addressed and may contain information that is privileged, confidential, or exempt from disclosure under applicable law. If you have received this communication in error, please delete the email from your system and notify me immediately.

Contact

Full Name: Brian Marshall Johnson

Last Name: Johnson

Middle Name: Marshall

First Name: Brian

Company: The Vogel Group

Business Address: Brian M Johnson 1010 Wisconsin Avenue, NW, Suite 530 Washington, D.C. 20007

Mobile Phone: (202) 378-8644

Web Page: www.vogelgroupdc.com

E-mail: Brian@VogelGroupDC.com

Message

From: Forman Matthew (FCA) [matthew.forman@fcagroup.com]
Sent: 8/23/2018 1:04:39 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: CEO meeting request
Attachments: ATT00001.txt

Hi Mandy. Hope your August is going well. FCA's new CEO, Mike Manley, is scheduled to come to DC on October 9 for introductory meetings with Administration officials. We would like Mr. Manley to meet the Acting Administrator if he is in town and available. Who would be the most appropriate person for me to contact and request an introductory meeting?

Best,
Matt



Matt Forman

Senior Manager, Federal Government Affairs
FCA US LLC
100 M Street SE, Suite 525
Washington, DC 20003
Office: 202.414.6707
Mobile: 202.578.5249
Matthew.forman@fcagroup.com

Message

From: Laura B Siegrist [laura_b_siegrist@whirlpool.com]
Sent: 8/1/2018 8:48:57 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
CC: Dominguez, Alexander [dominguez.alexander@epa.gov]
Subject: Re: Good seeing you

Perfect, thank you both.

Alex- outside of the next two Fridays (8/3 and 8/10) i'm free! Let me know what works best and I'll make it fit.

LAURA SIEGRIST SENIOR MANAGER, GOVERNMENT RELATIONS

T: (202) 639-9420 | C: (202) 738-3895 | Whirlpool Corporation | WhirlpoolCorp.com

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On Wed, Aug 1, 2018 at 4:11 PM, Gunasekara, Mandy <Gunasekara.Mandy@epa.gov> wrote:

Yes – looping in alex to help

From: Laura B Siegrist [mailto:laura_b_siegrist@whirlpool.com]
Sent: Wednesday, August 1, 2018 12:56 PM
To: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Subject: Re: Good seeing you

Hey there- any chance we can connect over the next couple of weeks? Would love to touch base on both HFC's and energy star. Let me know, thanks Mandy!

LAURA SIEGRIST SENIOR MANAGER, GOVERNMENT RELATIONS

T: (202) 639-9420 | C: (202) 738-3895 | Whirlpool Corporation | WhirlpoolCorp.com

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On Tue, Jun 26, 2018 at 3:30 PM, Laura B Siegrist <laura_b_siegrist@whirlpool.com> wrote:

Glad it worked to have the Administrator meet with our group last week. Thank you for helping to get that on the books!

Anything you all need from us / AHAM as follow up? I'm happy to provide any / all feedback I can. Just let me know, thanks Mandy.

LAURA SIEGRIST SENIOR MANAGER, GOVERNMENT RELATIONS

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Message

From: Vaughn Noga [LTS@gartner.com]
Sent: 7/31/2018 2:08:43 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Support with my transition into OEI

Hello Mandy,

As you're likely aware, I will return to the Office of Environmental Information (OEI) on August 6th as the Principal Deputy Assistant Administrator. I am writing today, before I start, to ask for your help and for your partnership. While everyone knows that EPA needs great information technology and information management (IT/IM) to support our common mission, neither I nor OEI alone can deliver that. It will take a collaborative approach with you, other Agency leaders, and all our customers. So, while I am eager to move out quickly and make a difference, I recognize I'll be more successful by first taking in the perspectives of you and others about the key opportunities for IT/IM improvement at EPA, as well as any strategic priorities you may have that will drive OEI's support to your office or program in the next year.

To get started, I've asked Gartner, a leading IT/IM research and advisory firm, to conduct a 25-minute "FasterForward" survey with you to gather information about OEI's performance and potential, as well as our customers' expectations and working styles. And while this survey won't and can't ever replace the ongoing conversations I am and will continue to have with you, it will complement them. It also has the added benefit of providing me immediate data on which I can set priorities for OEI, and hopefully deliver demonstrable results more quickly.

I understand too well that you are busy and 25 minutes is a big chunk out of your day. But I also hope that in taking this survey by August 14th you understand that it will inform my decisions and actions and help me improve OEI's service to the Agency. Please don't be afraid to be plain-spoken. Your responses as well as all qualitative and quantitative data will remain anonymous.

To get started, please click on the link at the bottom of this email. This link is personal; if you would like to nominate a colleague to participate in this exercise or have any questions, please contact Gartner, at lts@gartner.com

I look forward to receiving your input. Thank you!

Sincerely,
Vaughn Noga

<https://www.survey-executiveboard.com/se.ashx?s=251137455A4FFF3708D5F621AF3396A172>

Message

From: Niina Heikkinen [nheikkinen@eenews.net]
Sent: 8/9/2018 2:09:26 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Interview request

Hello,

My name is Niina Heikkinen and I'm a reporter with E&E News. I have been tracking climate rules at EPA and was interested in sitting down and talking with you about what to expect in the coming months. I would of course prefer to speak on the record, but happy to chat off the record or on background.

Please let me know if you are interested. I have already put in a request to speak with you through the press office and have not heard back yet.

Thanks for your help.

Sincerely,
Niina

E&E News
(C) 413-687-1789

Sent from my iPhone

Message

From: David Fialkov [dfialkov@natso.com]
Sent: 8/16/2018 10:31:43 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Re: Question

Okay thanks. I am quite sure they need to retire them by 9/15 but not sure how many rins.

On Thu, Aug 16, 2018 at 2:31 PM Gunasekara, Mandy <Gunasekara.Mandy@epa.gov> wrote:
It should be in the settlement agreement from the court. I'll check with the team.

Sent from my iPhone

On Aug 16, 2018, at 12:17 PM, David Fialkov <dfialkov@natso.com> wrote:

Mandy,

Do you know how I could ascertain how many RINs PES is obligated to buy in 2018 and when they need to retire them by?

--

David H. Fialkov
Vice President, Government Relations
Legislative and Regulatory Counsel
NATSO, Representing America's Travel Centers and Truckstops
dfialkov@natso.com
(703) 739 - 8501

--

David H. Fialkov
Vice President, Government Relations
Legislative and Regulatory Counsel
NATSO, Representing America's Travel Centers and Truckstops
dfialkov@natso.com
(703) 739 - 8501

Message

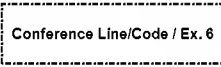

From: Nile Elam [Nile_Elam@ooida.com]
Sent: 7/27/2018 5:57:59 PM
To: Dominguez, Alexander [dominguez.alexander@epa.gov]; Bennett, Tate [Bennett.Tate@epa.gov]
CC: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: RE: independent truckers

Great thank you! I may have a couple colleagues join, but once I receive confirmation I'll send an email to you regarding names/titles

Thanks!
 Nile

From: Dominguez, Alexander <dominguez.alexander@epa.gov>
Sent: Friday, July 27, 2018 1:54 PM
To: Nile Elam <Nile_Elam@ooida.com>; Bennett, Tate <Bennett.Tate@epa.gov>
Cc: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Subject: RE: independent truckers

Great. Confirmed for a call Thursday, August 2nd at 11:30. Below is the conference line. Anything else please let me or Tate know.

Conference line: 
 ID: 

From: Nile Elam [mailto:Nile_Elam@ooida.com]
Sent: Friday, July 27, 2018 1:49 PM
To: Dominguez, Alexander <dominguez.alexander@epa.gov>; Bennett, Tate <Bennett.Tate@epa.gov>
Cc: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Subject: RE: independent truckers

Sure, next Thursday works – how about 11:30 EST?

From: Dominguez, Alexander <dominguez.alexander@epa.gov>
Sent: Friday, July 27, 2018 1:44 PM
To: Nile Elam <Nile_Elam@ooida.com>; Bennett, Tate <Bennett.Tate@epa.gov>
Cc: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Subject: RE: independent truckers

Hey Nile – Appreciate you reaching out and happy to discuss. The first half of next week isn't great, but would you be available for a call Thursday, August 2nd at 9:30 or 11:30?

Thanks,

Alex Dominguez
 Policy Analyst to the Principal Deputy
 Office of Air and Radiation
 U.S. Environmental Protection Agency

From: Nile Elam [mailto:Nile_Elam@ooida.com]
Sent: Friday, July 27, 2018 1:17 PM
To: Bennett, Tate <Bennett.Tate@epa.gov>; Dominguez, Alexander <dominguez.alexander@epa.gov>
Cc: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Subject: RE: independent truckers

Thanks for the introduction Tate!

Hey Alex & Mandy – happy to chat with y'all (if you have the time) to give you some perspective on what glider kits mean to all small business truckers and the messaging we've channeled to owner-operators/the feedback we've received.

I have my President in town next week for some meetings Monday and Tuesday, but I think we have some time Wednesday morning if you want to have some of OOIDA's leadership participate. If not, just let me know what you prefer and I'll accommodate accordingly.

Hope everyone has a great weekend!

Thanks!

Nile Elam | Director of Legislative Affairs
Owner-Operator Independent Drivers Association
nile_elam@ooida.com | (202) 347-2007
T: 800-444-5791



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From: Bennett, Tate <Bennett.Tate@epa.gov>
Sent: Friday, July 27, 2018 1:09 PM
To: Dominguez, Alexander <dominguez.alexander@epa.gov>
Cc: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>; Nile Elam <Nile_Elam@ooida.com>
Subject: independent truckers

Hey Alex! I volunteered Mandy to hop on the phone with me and the independent truckers (cc'd is their POC, Nile) next week. Is there a good time that works for you all next? I can work with what times work on OAR's end.

Elizabeth Tate Bennett
Associate Administrator for Public Engagement & Environmental Education
Office of the Administrator
U.S. Environmental Protection Agency

(202) 564-1460

Bennett.Tate@epa.gov

Message

From: Kelly Wright [kwright@mma-web.org]
Sent: 8/6/2018 3:18:07 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
CC: Woods, Clint [woods.clint@epa.gov]
Subject: RE: Key Note Speaker

Hey Mandy and Clint,

I just wanted to check in and see if y'all had a chance to discuss possibly coming to speak at the MMA conference in October. We have a steering committee this week, so I thought I would just see if there were any updates.

Thanks,
Kelly

From: Gunasekara, Mandy [mailto:Gunasekara.Mandy@epa.gov]
Sent: Friday, July 13, 2018 9:47 AM
To: Kelly Wright <kwright@mma-web.org>
Cc: Woods, Clint <woods.clint@epa.gov>
Subject: Re: Key Note Speaker

Clint- thanks for looping me in. Kelly, I appreciate the additional information. We will talk with our internal logistics teams and follow up soon.

Best,
Mandy

Sent from my iPhone

On Jul 13, 2018, at 10:34 AM, Kelly Wright <kwright@mma-web.org> wrote:

Hey Clint,

I am so thankful that y'all are interested in potentially coming to speak at our conference. As we are still in the planning stages, I don't have any official literature on the event yet, but the keynote address would be at about 8:45 am on the morning on Thursday, October 11th. The conference is in Philadelphia, MS at the Silver Star Resort/Casino. We generally have about 200-250 attendees from across the state and most are environmental consultants, environmental managers or MDEQ employees, so everyone is very interested in hearing about what's going on at the EPA and what that means for manufacturers. Let me know if there is any other information you need from me to make your decision and I look forward to being in touch.

Thanks,
Kelly Wright
Deputy Director of Government Affairs
Mississippi Manufacturers Association
601-292-1117 (Office)
601-842-9393 (Cell)

From: Woods, Clint [<mailto:woods.clint@epa.gov>]
Sent: Wednesday, July 11, 2018 9:25 PM
To: Maya Rao <mr Rao@trinityconsultants.com>
Cc: Kelly Wright <kwright@mma-web.org>; Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Subject: Re: Key Note Speaker

Maya,

Thanks so much for reaching out! I think we would definitely be interested in participating, and we should be able to discuss among the political team in the air office very soon. I have copied my colleague, Mandy Gunasekara, who may be particularly interested as a native Mississippian. Will be back in touch soon, but please feel free to send along any additional details.

Clint
202.564.6562

On Jul 11, 2018, at 1:30 PM, Maya Rao <mr Rao@trinityconsultants.com> wrote:

Hi Clint: Hope you are doing well and getting used to your new job. I guess there is no settling down period at EPA Headquarters and you are probably working from day one. For us Air folks, it's been exciting to get the new memos from the current EPA administration. We therefore wanted to Invite someone from Headquarters to speak this year .

Mississippi Manufacturer's Association is having their Annual Conference in Philadelphia, MS on October 11th. I wanted to see if you or one of your bosses can deliver the key note speech. They were planning on asking Administrator Pruitt, but now since he is no longer there, would still like someone from EPA headquarters. Please let me know if you think you or someone would be available.

I am CC-ing Kelly Wright, who is organizing the entire workshop. There are around 200 attendees and mostly from Industry. Kelly would be able to give you more details about the conference.

If you have any questions, or need me to send you additional information, please let me know. Looking forward to hearing back from you. I have missed going to the AAPCA meeting since I left MS DEQ, but hope to go to their fall meeting if my schedule allows.

Thanks, Maya

Maya Rao, PE, BCEE
Managing Consultant
Manager of Consulting Services, Jackson, MS

Trinity Consultants
1000 Highland Colony Parkway|Suite 5203| Ridgeland, MS 39157
Mobile: 601-672-4020
Email: mr Rao@trinityconsultants.com

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<image005.png>

Message

From: David Fialkov [dfialkov@natso.com]
Sent: 7/17/2018 3:27:30 AM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Re: Meeting with Pilot Flying J

No worries. Apologies I wasn't more clear I meant the 24th (one week from tomorrow)...If this changes things let me know. Either way safe travels tomorrow.

On Mon, Jul 16, 2018 at 10:20 PM, Gunasekara, Mandy <Gunasekara.Mandy@epa.gov> wrote:

Hey David,

Thanks for the note. I'm flying out to North Carolina tomorrow so won't be around to meet. Let me know when he is back in town and we'll try to make it work then.

Best,

Mandy

From: David Fialkov [mailto:dfialkov@natso.com]
Sent: Monday, July 16, 2018 5:19 PM
To: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Subject: Meeting with Pilot Flying J

Good afternoon Mandy.

Hope you've been surviving okay over there!

Will you have time to meet with Pilot on Tuesday? Michael Whitney will be in town and was hoping to check in briefly.

Let me know, thanks very much.

Dave

--

David H. Fialkov

Vice President, Government Relations

Legislative and Regulatory Counsel

NATSO, Representing America's Travel Centers and Truckstops

dfialkov@natso.com

(703) 739 - 8501

--

David H. Fialkov

Vice President, Government Relations

Legislative and Regulatory Counsel

NATSO, Representing America's Travel Centers and Truckstops

dfialkov@natso.com

(703) 739 - 8501

Message

From: Jaber, Makram [mjaber@hunton.com]
Sent: 7/20/2018 3:27:16 PM
To: Dominguez, Alexander [dominguez.alexander@epa.gov]
CC: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: RE: Request for meeting

Hi Alex,

I spoke with Mandy earlier today. I also just tried to call your cell, and I got a weird "all circuits are busy" message first and then that the cell phone number I'm calling is "not available at this time." Would you call me? My cell is Personal Phone / Ex. 6

Thank you.

Makram

-----Original Message-----

From: Dominguez, Alexander [mailto:dominguez.alexander@epa.gov]
Sent: Friday, July 20, 2018 9:58 AM
To: Jaber, Makram
Cc: Gunasekara, Mandy
Subject: RE: Request for meeting

Makram - I'm pretty open after 10:30 if you have a moment today to discuss. Cell is best 202-578-5985.

Thank you,
 Alex

-----Original Message-----

From: Jaber, Makram [mailto:mjaber@hunton.com]
Sent: Thursday, July 19, 2018 1:54 PM
To: Dominguez, Alexander <dominguez.alexander@epa.gov>
Cc: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Subject: RE: Request for meeting

Thank you.

Mandy, I will call you to give you a bit more information. Please let me know when would be a good time for me to do so.

Makram

-----Original Message-----

From: Dominguez, Alexander [mailto:dominguez.alexander@epa.gov]
Sent: Thursday, July 19, 2018 1:40 PM
To: Jaber, Makram
Cc: Gunasekara, Mandy
Subject: RE: Request for meeting

Makram,

You are confirmed for a meeting on Wednesday, July 25th at 11:00am with Mandy Gunasekara.

Conference Line: Conference Line/Code / Ex. 6
ID: Conference Line/Code / Ex. 6

Yes, if you could please provide a little more information on details of the discussion that will help determine the appropriate technical staff that attend.

Alex

Directions and procedures to 1200 Pennsylvania Avenue NW:

Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

Taxi: Direct the taxi to drop you off on 12th Street NW, between Constitution and Pennsylvania Avenues, at the elevator for the Federal Triangle metro stop - this is almost exactly half way between the two

avenues on 12th Street NW. Facing the building with the EPA logo and American flags, walk toward the building and take the glass door on your right hand side with the escalators going down to the metro on your left - that is the North Lobby of the William Jefferson Clinton building.

Security Procedures: A government issued photo id is required to enter the building and it is suggested you arrive 15 minutes early in order to be cleared and arrive at the meeting room on time. Upon entering the lobby, the meeting attendees will be asked to pass through security and provide a photo ID for entrance. If you are a foreign national entering on a non-US passport, please let us know in advance, as there is a separate clearance process.

Upon arrival, let the guards know that you were instructed to call 202-564-7404 for a security escort.

Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

-----Original Message-----

From: Jaber, Makram [mailto:mjaber@hunton.com]

Sent: Thursday, July 19, 2018 11:32 AM

To: Dominguez, Alexander <dominguez.alexander@epa.gov>; Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>

Subject: RE: Request for meeting

Alex,

Thank you. 11 am - 12 pm on July 25th works for us.

Mandy, thank you for agreeing to meet with us. The following persons will attend in person:

Kelly Barr, Salt River Project, Associate General Manager and Chief Corporate Services and Sustainability Executive Lauren Freeman, Hunton Andrews Kurth Makram Jaber, Hunton Andrews Kurth

Some folks from SRP (both in-house counsel and technical folks) will probably attend by phone. We will need a call-in number for them. Would you like me to circulate one, or should we use an EPA conferencing number?

If you'd like to get a bit more information about the matter we want to discuss with you in advance of the meeting, please let me know.

Best Regards.

Makram

-----Original Message-----

From: Dominguez, Alexander [mailto:dominguez.alexander@epa.gov]

Sent: Wednesday, July 18, 2018 11:17 AM

To: Jaber, Makram; Gunasekara, Mandy

Subject: RE: Request for meeting

Makram - Unfortunately Mandy is on travel Tuesday. Can you meet Wednesday, July 25th at 11:00?

Alex

-----Original Message-----

From: Jaber, Makram [mailto:mjaber@hunton.com]

Sent: Tuesday, July 17, 2018 10:58 AM

To: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>

Cc: Dominguez, Alexander <dominguez.alexander@epa.gov>

Subject: RE: Request for meeting

Hi Mandy, Alex,

I don't mean to bug you, but given that some of the folks attending this meeting for SRP have to make travel arrangements from Phoenix, we would greatly appreciate it if you can confirm to us -- preferably today -- the date and time for this meeting. Our preferred date for the meeting is July 24th, any time that works for you. If the 24th is not feasible, we can meet any time before noon on July 25th.

Thank you!

Makram

-----Original Message-----

From: Jaber, Makram

Sent: Friday, July 13, 2018 6:32 PM

To: Gunasekara.mandy@Epa.gov

Cc: Dominguez Alexander

Subject: Request for meeting

Hi Mandy,

As we discussed, Salt River Project is requesting a meeting with you about an issue related to the Navajo Generating Station. The attendees would be Kelly Barr, associate general manager, Maribeth Klein, senior counsel, and myself. The dates that work best for us are July 24, any time, or July 25, preferably before noon.

Thank you.

Have a nice weekend.

Makram

Sent from my iPhone

Message

From: Gunasekara, Mandy [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=53D1A3CAA8BB4EBAB8A2D28CA59B6F45-GUNASEKARA,]
Sent: 12/20/2018 12:01:44 AM
To: Kern, Gretchen [Gretchen.Kern@pxd.com]
Subject: Re: [External] - Your Comment Submitted on Regulations.gov (ID: EPA-HQ-OAR-2017-0483-0005)

Thank you!

Sent from my iPhone

On Dec 19, 2018, at 11:50 AM, Kern, Gretchen <Gretchen.Kern@pxd.com> wrote:

Mandy,

It was nice meeting with you on December 4th with Lee Fuller from IPAA to discuss IPAA and Pioneer's priority issues in the proposed Quad Oa technical revisions.

As you requested, I have attached Pioneer's comments for your review and consideration. I also e-filed them in the docket on the 17th.

As always, I appreciate your time willingness to work with us on these important issues, and I look forward to continuing our dialogue on this rulemaking.

Thank you! Gretchen

GRETCHEN C. KERN
Sr. Environmental Policy Advisor
Sustainable Development

w 972.969.3936
m 214.502.2853

<image001.png>

From: no-reply@regulations.gov [mailto:no-reply@regulations.gov]
Sent: Monday, December 17, 2018 12:23 PM
To: Kern, Gretchen <Gretchen.Kern@pxd.com>
Subject: [External] - Your Comment Submitted on [Regulations.gov](https://www.regulations.gov) (ID: EPA-HQ-OAR-2017-0483-0005)

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Agency: Environmental Protection Agency (EPA)

Document Type: Rulemaking

Title: Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Reconsideration

Document ID: EPA-HQ-OAR-2017-0483-0005

Comment:

See attached file(s)

Uploaded File(s):

- Pioneer comments to EPA's NSPS Quad Oa Technical Revision Proposed Rule_12_17_18.pdf

For further information about the Regulations.gov commenting process, please visit <https://www.regulations.gov/faqs>.

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<Pioneer comments to EPA's NSPS Quad Oa Technical Revision Proposed Rule_12_17_18.pdf>

Message

From: Gunasekara, Mandy [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=53D1A3CAA8BB4EBAB8A2D28CA59B6F45-GUNASEKARA,]
Sent: 12/7/2018 1:29:38 PM
To: Holdsworth, Eric [EHoldsworth@eei.org]
Subject: Re: COP-24: EEI Dinner and Events

I'm glad to hear you are successfully navigating the COP. I'll pass along the reception info and look forward to seeing you there soon.

Best,
Mandy

from my iPhone

On Dec 7, 2018, at 6:45 AM, Holdsworth, Eric <EHoldsworth@eei.org> wrote:

Mandy,

Please pardon the informal nature of this email, but am here at the COP and trying to cover a lot of ground. Thanks for your voice mail yesterday. Please let Alex and James know that they are welcome to join us at the reception. Unfortunately, our dinner number is very limited so need to limit that invitation to you. Look forward to seeing you over here. The venue is very spread out so lots of walking through narrow hallways.

Eric

From: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Sent: Monday, December 3, 2018 3:54 PM
To: Holdsworth, Eric <EHoldsworth@eei.org>
Subject: Re: COP-24: EEI Dinner and Events

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I, along with Alex and James, land at 1 on Monday. Given the schedule we are going to mid the US event, but will be there in time for the reception and dinner.

Thanks for thinking of us.

Sent from my iPhone

On Dec 3, 2018, at 3:47 PM, Holdsworth, Eric <EHoldsworth@eei.org> wrote:

That would be great. When are you arriving at the COP? I will be in Poland starting this Thursday, Dec. 6 and am around through the 12th. Look forward to seeing you over there.

Eric

From: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Sent: Monday, December 3, 2018 3:43 PM
To: Holdsworth, Eric <EHoldsworth@eei.org>
Subject: RE: COP-24: EEI Dinner and Events

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Thank you Eric. I will send these to my ethics team to vet, but barring their objection, I will plan to attend.

From: Holdsworth, Eric <EHoldsworth@eei.org>
Sent: Monday, December 3, 2018 3:33 PM
To: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Subject: COP-24: EEI Dinner and Events

Mandy,

Following up on our earlier conversations regarding COP-24, which you had indicated you plan to attend, I am once again coordinating the EEI delegation and would like to invite you to the following events EEI is co-sponsoring:

- A reception in honor of the U.S. delegation being sponsored by U.S. industry, which will take place Monday, December 10 from 6:30 pm to 8 pm at Via Toscana in Katowice
- Ninth annual EEI-C2ES dinner in honor of the U.S. delegation which will take place Monday, December 10 starting at 8 pm at Via Toscana in Katowice

Attached are invitations to each. I hope you will be able to join us at these widely attended events. RSVP information is listed on each invitation.

I look forward to seeing you at the COP. Please do not hesitate to contact me if you have any questions.

Eric Holdsworth

Eric Holdsworth
Senior Director, Climate Programs | Edison Electric Institute
202-508-5103 - office | 202-285-9587 - mobile | eholdsworth@eei.org

Message

From: Gunasekara, Mandy [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=53D1A3CAA8BB4EBAB8A2D28CA59B6F45-GUNASEKARA,]
Sent: 12/3/2018 8:53:31 PM
To: Holdsworth, Eric [EHoldsworth@eei.org]
Subject: Re: COP-24: EEI Dinner and Events

I, along with Alex and James, land at 1 on Monday. Given the schedule we are going to mid the US event, but will be there in time for the reception and dinner.

Thanks for thinking of us.

Sent from my iPhone

On Dec 3, 2018, at 3:47 PM, Holdsworth, Eric <EHoldsworth@eei.org> wrote:

That would be great. When are you arriving at the COP? I will be in Poland starting this Thursday, Dec. 6 and am around through the 12th. Look forward to seeing you over there.

Eric

From: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Sent: Monday, December 3, 2018 3:43 PM
To: Holdsworth, Eric <EHoldsworth@eei.org>
Subject: RE: COP-24: EEI Dinner and Events

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Thank you Eric. I will send these to my ethics team to vet, but barring their objection, I will plan to attend.

From: Holdsworth, Eric <EHoldsworth@eei.org>
Sent: Monday, December 3, 2018 3:33 PM
To: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Subject: COP-24: EEI Dinner and Events

Mandy,

Following up on our earlier conversations regarding COP-24, which you had indicated you plan to attend, I am once again coordinating the EEI delegation and would like to invite you to the following events EEI is co-sponsoring:

- A reception in honor of the U.S. delegation being sponsored by U.S. industry, which will take place Monday, December 10 from 6:30 pm to 8 pm at Via Toscana in Katowice
- Ninth annual EEI-C2ES dinner in honor of the U.S. delegation which will take place Monday, December 10 starting at 8 pm at Via Toscana in Katowice

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I look forward to seeing you at the COP. Please do not hesitate to contact me if you have any questions.

Eric Holdsworth

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